# THE IRON TRADE REVIEW

Volume XLVI CLEVELAND, FEBRUARY 3, 1910 Number 5

## SPRING ACTIVITY

### IS EXPECTED TO FOLLOW DULL PERIOD.

### Buyers Placing Orders Conservatively ---Foundry Pig Develops Some Soft Spots---Weakness in Coke.

All things considered, the first month of the year has given a very good account of itself, but not much is usually expected of January. In spite of considerable irregularity and dullness, price changes have not been important and mill activities continue unabated. Orders for finished material are perhaps as numerous as at any time last year, but for smaller amounts. Owing to the heavy specifying prior to Jan. 1, many consumers are well supplied with materials, and are buying in a very conservative way. There is a goodly number of car inquiries, and some important orders for rails are pending. Bookings for export have been substantial, and the markets in the far east, British and Continental markets show higher prices and decided improvement in general conditions.

**Pig Iron**

Following the making of some price concessions, there has been considerable activity in pig iron in the east. No. 2X can now be had at Virginia furnace at $15.50, which, with the low freight rate now prevailing, saves the consumer 75 cents per ton. In the Chicago district, selling of malleable has continued, and it is estimated that the sales for the month amounted to about 45,000 tons in that district. In the Pittsburg district, extraordinary efforts to depress the market have been made by the circulation of false and misleading reports concerning recent trades of pig iron for billets, on which the prices of both pig iron and crude steel were put in the contracts at considerably below prevailing quotations. These reports have had a tendency to check buying, but not enough business has developed to test the market. No. 2 foundry has developed some weakness in the Pittsburg district, and brokers are selling at concessions for prompt shipment. The Bessemer market continues quiet but firm. On the whole, the outlook for pig iron seems to be that the present month will be quiet, with probably some price reductions. It is confidently expected that improvement will set in next month, or at least by April 1.

**Plates and Sheets.**

Demand for plates shows some decrease, especially in eastern territory, where deliveries are being much more promptly made than for some time past. The leading interest will furnish 8,000 tons for each of the two battleships to be built for the Argentine Republic, and has also received a contract for 6,600 tons of plates for riveted pipe for work on the Catskill aqueduct. The Virginian Railroad has placed an order for 1,000 gondolas with the Pressed Steel Car Co., which will also build some of the 3,000 cars for the Norfolk & Western. Some price concessions on plates are being made in the east. Premiums are still being paid for prompt delivery of sheets, but some of the independent interests are showing more anxiety to take orders and are giving somewhat better delivery.

**Rail Orders.**

The B. & O. order for rails has been placed, the total being unofficially stated at about 70,000 tons, of which 25,000 went to the Pennsylvania Steel Co., and the remainder to the Steel Corporation. The Harriman Lines have ordered 16,000 tons from the Tennessee Coal, Iron & Railroad Co., and 32,000 tons from the Illinois Steel Co., both being additional orders. The Reading has ordered 5,000 tons from the Carnegie Steel Co., and the Illinois Steel Co. reports scattered sales of 4,000 tons. Bookings of light rails at Pittsburg are fairly good, and premiums are being paid on track bolts for prompt delivery.

**Steel Bars.**

Agricultural implement manufacturers are making preliminary inquiries concerning contracts for their requirements of steel bars for the year beginning July 1. The market seems to be firm at 1.50c, Pittsburg, on all but the most desirable business, on which 1.45c can be done. A contract for 40 miles of steel pipe for use in northwestern Pennsylvania gas fields has been taken by an independent interest. Other line pipe contracts are pending.

**Coke is Weak**

The coke market, especially for prompt furnace, has displayed considerable weakness. Low prices are now being named on some grades. The possibility of a strike of coal miners may improve the demand for coke. The demand for foundry grades is only moderate.

### MILLS RESUME.

Pittsburg, Feb. 2. (By wire.)

Three finishing mills at the Brown-Bonnell plant of the Republic Iron & Steel Co., which were idle for a few days on account of scarcity of steel, have resumed operations and the company is now operating all its mills to capacity. No. 1 blast furnace at Haselton, which was out for about a month for re-lining and other improvements, has been started.

### PIPE LINE CONTRACTS.

Pittsburg, Feb. 2. (By wire.)

A contract for 40 miles of six and eight-inch steel line pipe for use in a northwestern Pennsylvania gas field has been awarded to an independent interest. Two or three other fairly large contracts for line pipe now pending will be closed shortly.

# THE WEEK IN IRON CENTERS

## PITTSBURG.

### Excitement Over False Reports in Basic Subsides—Pig Iron Dull.

Office of THE IRON TRADE REVIEW,
510 Park Building, Feb. 1.

Some lines of the iron and steel industry are showing a slight improvement over the past week. This applies not only to the manner in which consumers are specifying against contracts, but to new business, which, while comparatively light, is of sufficient volume to give the general market a firmer tone. In most cases, the trade generally is satisfied with the showing made during the first month of the year, no great expectations having been held out for the initial month.

The volume of new business in plates during January compares favorably with that of either October, November or December of last year and there is a fair offering of new tonnage in sight for the next several months. The latest large tonnage sold went to coast shipbuilding interests. Large tonnage is involved in inquiries for sheet bars to cover requirements over the remainder of the year, but makers decline to make quotations so far ahead. Other semi-finished products are in demand and premiums for immediate delivery are still being offered.

Owing to the continued activity shown in the sheet situation both in new offerings and in mill orders entered, premiums are still being paid for prompt shipment. New bookings are noted in steel bars and little, if any, shading of current quotations is in evidence. Railroads are showing a disposition to close up some of the contracts now pending for rails and equipment. The rail situation appears somewhat stronger and announcements of new tonnage are expected shortly. Some fairly large car orders are ready to be closed and a few contracts for new cars were placed during the week.

**Pig Iron.**—The expected buying movement in pig iron in the Pittsburg territory has not made its appearance as yet and the market continues to be dull and with no sales of importance. The flurry in the basic market caused by an exchange deal, which was given out and published in New York as a straight sale for second and third quarter delivery at prices below the current market quotations, has subsided and market ideas have returned to the basis in vogue before the temporary excitement. There has been no inquiry which would offer a fair test of actual market prices. Both furnace interests and middlemen are quoting $17, valley, for prompt delivery of basic pig iron, while in a few instances of particularly desirable business this figure probably could be shaded to a very slight degree, although the condition would not hold good for delivery beyond ten days or two weeks.

There is little new inquiry in this district for Bessemer, and while there has not been a sufficient volume of new tonnage going to test the market, quotations of $19, valley, still hold good. Inquiries for small lots of Bessemer for second quarter delivery are coming out, but sellers are not ready to make quotations on business that far in advance.

Small inquiries for malleable are noted, but few sizable sales are being made. An eastern concern is in the market for 1,000 tons and a western interest is out for an equal amount.

Foundry iron continues quiet, and, while shading is being done by brokers on spot iron, furnace interests continue to quote $17, valley, the business not being sufficiently attractive or of large enough tonnage to try the stability of this figure.

The average monthly pig iron prices as announced for January show the average on basic to be $16.875, valley, or $17.775, Pittsburg, as against the December average of $17.004, valley, or $17.904, Pittsburg. The Bessemer average for January was $19.90, Pittsburg, the same as in December.

#### Pig Iron Prices.

(Prompt Shipment.)

| | |
|---|---|
| Bessemer, valley | $19.00 |
| Bessemer, Pittsburg | 19.90 |
| Basic, valley | 17.00 |
| Basic, Pittsburg | 17.90 |
| No. 2 foundry, Pittsburg | 17.90 |
| Gray forge, Pittsburg | 17.15 |
| Malleable, Pittsburg | 18.15 |
| (First Quarter.) | |
| Bessemer, valley | 19.00 |
| Bessemer, Pittsburg | 19.90 |
| Basic, valley | 17.25 |
| Basic, Pittsburg | 18.15 |
| No. 2 foundry, Pittsburg | 18.15 |
| Gray forge, Pittsburg | 17.15 |
| Malleable, Pittsburg | 18.15 |

**Ferro-Alloys.**—There is little change noted in the ferro-alloy market in this district. A few scattered sales of ferro-manganese, on a basis of $44 to $45, Baltimore, are noted, and inquiries show a slightly stronger tone. Users of 50 per cent ferro-silicon are fairly well covered, and there appears to be little buying at this time.

We quote ferro-manganese at $44 to $45, Baltimore, for immediate shipment or for first half, and from $45 to $45.50 for second half. The freight rate from Baltimore to Pittsburg is $2.30 per ton.

Fifty per cent ferro-silicon is quoted at $62.50 to $63.50, Pittsburg; domestic 12 per cent, $25.90; 11 per cent, $24.90; 10 per cent, $23.90, Pittsburg, for prompt, first quarter, and $1 advance for second quarter. The foreign grades are held at $1 or more a ton over domestic prices.

**Plates.**—Considerable new business in plates is noted and some makers report that the volume of business handled in January compares favorably with that of either October, November or December of the old year. Specifications against contracts are satisfactory to makers, and deliveries are fairly good. The leading interest has received contracts for 8,000 tons of hull material for each of the two battleships to be built for the Argentine Republic, and also 6,600 tons of plates for riveted pipe in connection with the building of the Catskill aqueduct. There are some new inquiries for cars coming out. The Virginian Railway has placed an order for 1,000 gondolas with the Pressed Steel Car Co. This company will also build a portion of the 3,000 cars for the Norfolk & Western. It is expected that the remainder of the order will be placed shortly. The Standard Steel Car Co. has put on a night force at the Butler, Pa., plant and is preparing plans for improvement at the Middletown, Pa., plant. The outlook for the plate business is considered promising. Prices are firm, although reports of shading in a few districts are current. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.55c to 1.60c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. A. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.20c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches, excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end not being less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including 3-16 inch plate on thin edge, 0.10c; under 3-16 inch and including No. 9, 0.25c. Five cents extra for less than carloads. Terms, net cash in 30 days.

**Sheets.**—Independent sheet makers are still receiving, and in some cases are accepting, premiums over the price schedule quoted by the largest interest. On blue annealed sheets, premiums up to $3 a ton over the ruling quotation are in evidence, and some buyers are offering a premium of $2 on galvanized sheets for prompt delivery. Makers report that a fairly large volume of new business for second half is coming out, but in most

cases they refuse to book so far ahead. Specifications against contract are coming in freely and there has been little, if any, improvement in deliveries. Present sheet prices, Pittsburg base, are as follows, with $1 a ton added as the delivered price in the Pittsburg district:

Blue annealed sheets, Nos. 3 to 8, 1.70c; Nos. 9 and 10, 1.75c; Nos. 11 and 12, 1.80c; Nos. 13 and 14, 1.85c; Nos. 15 and 16, 1.95c; box annealed sheets, Nos. 10 and 12, 2.05c; Nos. 13 and 14, 2.10c; Nos. 15 and 16, 2.15c; Nos. 17 to 21, 2.20c; Nos. 22 to 24, 2.25c; Nos. 25 and 26, 2.30c; Nos. 27, 2.35c; No. 28, 2.40c; No. 29, 2.45c; No. 30, 2.55c; galvanized sheets, Nos. 12 to 14, 2.50c to 2.55c; Nos. 15 and 16, 2.60c to 2.65c; Nos. 17 to 21, 2.75c; Nos. 22 to 24, 2.90c; Nos. 25 and 26, 3.10c; No. 27, 3.30c; No. 28, 3.50c; No. 29, 3.60c; No. 30, 3.85c; painted roofing sheets, $1.70 per square for No. 28 gage, 2½-inch corrugation, and galvanized roofing sheets, $3 per square for No. 28 gage, 2½-inch corrugation.

**Tin Plate.**—Consumers of tin plate having been well covered some weeks ago for their requirements during the first half of the year, there appears to be little buying in this line at present. Makers are well pleased with the manner in which specifications are coming in, but they have been unable to show much improvement in deliveries. It is expected that shipments to Pacific coast packers will be well under way within the next ten days. Four hot mills at the Morewood plant of the American Sheet & Tin Plate Co., at Gas City, Ind., which were to have been placed in operation several days ago, were not started until Monday of this week. The company is now operating 185 out of a serviceable capacity of 235 hot mills. The base price on tin plate, over which some premiums have been paid for desirable deliveries, is as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.60, f. o. b. mill, Pittsburg district.

**Rails and Track Material.**—Further progress is reported in negotiations for standard rails and the indications are that some fairly large sales will be announced shortly. Some new inquiries are coming out, and a few of the railroads which have been holding back their orders are expected to come into the market before long. Several thousand tons of standards in small orders for prompt delivery are being entered weekly by the local makers. Bookings for light rails during the last week aggregated approximately 3,400 tons, this being an increase over the last several weeks. Small spikes are fairly active. Some makers continue to report premiums on track bolt rods for prompt delivery. Deliveries are not entirely satisfactory because of the sold up condition of the mills and the Pittsburg base price remains firm at from $31 to $32. We quote standard Bessemer rails as follows, the base price for open-hearth rails being $30, mill:

Fifty-pound and heavier, 500-ton lots and over, $28; carloads and less than 500 tons, $30; less than carload lots, $32; light rails on base weight of 40 to 45 pounds, $28, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburg; standard spikes, 1.75c to 1.80c, Pittsburg; hand spikes, 1.80c to 1.85c, Pittsburg; track bolts, 2.50c, Pittsburg.

**Steel.**—In the semi-finished lines, the market is a little quiet, although some large inquiries for second and third quarter are coming out. Inquiries for sheet bars, involving very heavy tonnage, to cover requirements over last half are reported, but makers are not inclined to book so far ahead. There is but a small amount of new tonnage for prompt delivery being taken, as makers say they are not in a position to guarantee prompt shipment. Premium prices in some quarters continue to be quoted for open-hearth steel. Small open-hearth billets continue to command high level prices. Specifications are good and there has been but little, if any, improvement in deliveries.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $27.50 to $28, Pittsburg, with the usual extras for size and analysis, and open-hearth rolling billets from $30 to $31, Pittsburg. Forging billets are quotable at $32 to $33, Pittsburg. Sheet and tin bars are quoted at $28.50 to $29 at makers' mill, located within the $1 Pittsburg freight limits.

**Hoops and Bands.**—Some new business in hoops and bands is coming out, but manufacturers report that deliveries are not as good as during the first few weeks of the year. Alleged shading of the 1.60c base on hoops has been eliminated, and in some quarters makers intimate that a slight increase in prices may be expected. Specifications are very liberal. We quote the present market as follows:

Hoops in carload lots, 1.60c to 1.65c; in less than carload lots, 1.70c to 1.75c; bands, 1.50c to 1.55c, base, with net extras as per standard steel.

**Merchant Bars.**—Steel bar makers are receiving inquiries for a fairly large volume of steel bars, largely for second quarter requirements, the new bookings being about equal to their plant capacity. Specifications are slightly heavier than a few weeks ago, so that there has been no noticeable improvement in deliveries, which average from four to six months. Some makers report that they are declining new business at 1.50c, Pittsburg, because of the sold up condition of their plants, although this represents the general market. Deliveries of bar iron are more favorable to buyers, and some new business is appearing. Shafting business continues heavy and deliveries with some plants extend over a period of eight weeks. We quote the market as follows:

Common iron bars, 1.70c to 1.75c, Pittsburg; Bessemer and open-hearth steel bars, 1.45c to 1.50c; plow and cultivator, 1.45c to 1.50c; channels, angles, zees, tees, under 3-inch, 1.45c to 1.50c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds, 0.15c advance; less than 1,000 pounds of a size, 0.35c advance. Cold rolled and ground shafting, 55 per cent in carloads and 50 per cent in less than carloads, delivered in base territory.

Planished and machine straightened tire is 1.70c base; iron finished tire under 1½ by 1½ inches, 1.65c, both plus net extra on tire card; iron finished tire, 1½ by ½ and over, 1.50c, plus net extra on the steel bar card.

On cold rolled strip steel, with 1½ inches and wider, and 0.100-inch and thicker, we quote base prices for 100 pounds, $3.35 on hard, and $3.60 on soft, except in carload lots of one size, where the price is lower.

**Structural Material.**—New business in structural steel lines is not coming out in as large proportions as expected, due partly to weather conditions and to the failure of prospective builders to have plans for new work completed as soon as originally expected. Much of the structural business usually handled during the opening months of the year is being held up temporarily, but makers and fabricators believe that there will be a material change in the situation within the next 30 days. Owing to the decision of Venango county commissioners to make several changes in plans for the proposed bridge across the Allegheny river at Oil City, Pa., bids for this work will not be opened for the present. Other bridge work in this section is also being held up. Pittsburg architects announce that contracts for structural steel to be used in proposed buildings in this city will be awarded sometime in February. A few of the initial railroads have about completed plans for minor

extensions and improvements which will involve a fairly large amount of structural material. We quote present shape prices as follows:

Beams and channels, 15-inch and under, 1.55c to 1.60s; over 15 inches, 1.65c to 1.70c; zees, 1.55c to 1.60c; tees, 1.55c to 1.60c; angles, from 3 to 6 inches, 1.55c to 1.60c; over 6 inches, 1.55c to 1.70c; universal and sheared plates, 6¼ inches wide and wider, 1.55c to 1.60c.

**Merchant Pipe.**—Makers of tubular goods report that, in addition to the sales of the past week, inquiries for additional business are coming out. A local gas company purchased 3 miles of 8-inch line pipe from an independent interest. The Monongahela Gas Co. bought 2 miles of 10-inch steel line pipe, while another local interest has purchased 3 miles of 10-inch line pipe. Another large contract, now pending, likely will be closed in a few days. The Philadelphia company's inquiry for approximately 5,500 tons of wrought iron well goods of various sizes is still pending. We quote the following official discounts in carload lots, subject to the usual additional discounts to the largest buyers, merchant pipe, where specified, being furnished in from ⅛ to 6 inches, and in plugged and reamed lots:

| | —Steel— | | —Iron— | |
|---|---|---|---|---|
| | Black. | Galv. | Black. | Galv. |
| ⅛ and ¼ inch..... | 70 | 54 | 63 | .. |
| ⅜ inch ..... | 71 | 57 | 66 | 52 |
| ½ inch ..... | 74 | 62 | 69 | 57 |
| ¾ to 6 inch ..... | 78 | 68 | 73 | 63 |
| 7 to 12 inch..... | 72 | 57 | 67 | 52 |
| 13 to 15 inch ..... | 51½ | .. | .. | .. |
| PLUGGED AND REAMED. | | | | |
| 1 to 4 inch ..... | 76 | 66 | 71 | 61 |
| EXTRA STRONG PLAIN ENDS. | | | | |
| ⅛ to ¾ inch..... | 63 | 51 | 58 | 46 |
| ⅛ to 4 inch ..... | 70 | 58 | 65 | 53 |
| 4½ to 8 inch ..... | 66 | 54 | 61 | 49 |
| 9, 10, 11 and 12 inch | 59 | 47 | 54 | 42 |
| DOUBLE EXTRA STRONG PLAIN ENDS. | | | | |
| ⅛ to 8 inch ..... | 59 | 48 | 54 | 43 |

**Boiler Tubes.**—Both merchant and locomotive buyers of boiler tubes continue to show a slight increase in their demands and makers appear to be satisfied with the present market. In some quarters, deliveries are not quite so satisfactory, ranging from three to four weeks. The price list on boiler tubes, showing the official discounts to the largest buyers, is as follows:

| | Steel. | Iron. |
|---|---|---|
| 1 to 1½ inch ..... | 49 | 43 |
| 1¾ to 1¼ inch..... | 61 | 43 |
| 2½ inch ..... | 63 | 48 |
| 2¾ to 5 inch..... | 69 | 55 |
| 6 to 13 inch ..... | 60 | 43 |

2¼ inch and smaller, over 18 feet, 10 per cent net extra.

2¾ inch and larger, over 22 feet, 10 per cent net extra.

To destinations east of the Mississippi river will be sold at delivered discount for carloads lowered by two points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburg.

**Wire Products.**—Little new business in wire products is coming out at present. Specifications have fallen off slightly and the wire market is quiet. Makers, however, expect that the spring business will come in shortly and some fairly good contracts are in sight. Although some price concessions in nails on desirable business are reported, makers advise that prices in general are being maintained. We quote the market as follows, contracts with the jobbing trade being limited usually to 60 days:

Wire nails, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; painted barb wire, jobbers' carload lots, $1.85; retailers' carload lots, $1.90; with 30c for galvanizing; plain wire to jobbers in carloads, $1.65, and to dealers in carloads, $1.70; polished staples, $1.85; galvanized staples, $2.15.

**Wire Rods.**—Makers of wire rods report that there is little more inquiry in this market for prompt delivery and a few small sales are noted. Users are specifying in a satisfactory manner, and a slight improvement in deliveries is noted. We quote the market at $33 and $34, Pittsburg, on Bessemer and open-hearth rods.

**Coke.**—The coke market continues to show some weakness. Production is heavy and several fairly good inquiries are noted, although there is little doing in the way of actual sales. Some of the furnace interests are showing a disposition to increase their stock to cover the next 30 days as a result of current reports regarding a probable suspension of mining operations for a brief period when the present wage scale between operators and miners expires. Accumulated stocks of off grade furnace coke have been thrown upon the market in small lots and some price concessions are noted. Standard Connellsville furnace coke is quoted at $2.50 to $2.60, ovens, although $2.35, ovens, can be done on off grade furnace coke. There is little change in the foundry coke market and prices are being well maintained. We quote, Standard Connellsville furnace coke for prompt shipment at from $2.50 to $2.60, ovens, and on contract from $2.65 to $2.70, ovens. On high grade Connellsville foundry coke we quote from $3 to $3.15, ovens, for prompt and from $3 to $3.25 on contracts. The Connellsville *Courier's* figures for the week ending Jan. 22, show 36,794 ovens active with an output of 471,222 tons, compared with 36,343 active ovens and a production of 457,415 tons the previous week.

**Old Material.**—No large sales of old material in the Pittsburg territory are being made at present. Users appear to have fairly large stocks on hand and in some cases are not drawing upon their stocks, as they are obliged to move carload lots for which contracts were given some time ago. Consumption is showing a slight gain in some sections and dealers believe that there is some fairly good business in sight. It is expected that some of the heavy stocks purchased during the year end will be consumed within the next 30 days and that buying will be more active. Dealers have fairly large stocks on hand. A slight reduction in rerolling rails is noted, the quotations now being $18 to $18.50. Machine shop turnings also show a slight reduction, the asking price now being about $12.75 to $13.25, while stove plate is firm at from $13 to $13.50. We quote, gross tons, delivered in the Pittsburg district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

| | |
|---|---|
| Heavy melting scrap ..... | $17.50 to 17.75 |
| Rerolling rails ..... | 18.00 to 18.50 |
| Bundled sheet scrap ..... | 15.00 to 15.50 |
| Iron axles ..... | 27.00 to 27.50 |
| Old iron rails ..... | 19.00 to 19.50 |
| No. 1 wrought scrap..... | 19.00 to 19.25 |
| Old car wheels ..... | 17.00 to 17.50 |
| Low phosphorus ..... | 21.50 to 22.50 |
| Machine shop turnings ..... | 12.75 to 13.25 |
| Cast borings ..... | 10.50 to 11.00 |
| No. 1 cast scrap..... | 16.50 to 17.00 |
| Malleable ..... | 16.50 to 17.00 |
| Stove plate ..... | 13.00 to 13.50 |

## CHICAGO.

### Moderate Pig Iron Buying—Heavy Finished Material Specifications.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Feb. 1.

The month of January made a record as a business producer which is not to be despised. The total fell short of some of the phenomenal records made in a few of the closing months of 1909, but, when it is considered that the first month of the year usually is a very dull one, from a business standpoint, the business done in iron and steel lines for this January made an exceptionally favorable showing. Specifications were heavy in nearly every branch of the iron and steel business, and, in the case of some of the heavy jobbers in this city, the amount of business handled during the month passed all records. This was true of December, and, as a matter of surprise, the tide of business during January rose even higher than the point established by the preceding month. New business in structurals and rails continues large, especially in the light of the present condition of the mills in this territory making that class of material. Sheets are in demand, and in some cases, higher prices are demanded for galvanized.

Taking a broad view of the situation, as the trade enters another month, there is nothing upon which to base any pessimistic outlook. There seems to be a tendency, on the part of some, to see some distressing things in the vicinity of Washington, but there is a strong suspicion, in the minds of those who believe in the greatness of this country and who have faith in the onward march which they are expecting business interests to make, that a large portion of the fear is assumed, in order to create the impression that disaster will follow the carrying out of some of the administration policies. The more hopeful are assured that the elements are all present for one of the greatest commercial and industrial years this country ever has known, and that nothing can stop it. The freight rate on pig iron from eastern and southern Ohio points and western Pennsylvania and New York points goes into effect today, but there is strong pressure being brought to bear by shippers in competing territory to have the old rate restored. This point will be acted upon within the next few days. A small cloud on the labor horizon has been dispelled by the return to work of the employes of the Standard Steel Car Co., at Hammond, Ind., after being out a few weeks. There was only a small percentage of the workmen, mostly foreigners, who were dissatisfied, but they intimidated their fellow countrymen into joining the strike. The company made no effort to fill the places of the strikers, and the latter soon tired of idleness and the absence of the pay envelope.

**Pig Iron.**—Moderate buying has marked the course of the pig iron market during the past week. Taking the two last weeks in January together, there has been a very fair tonnage of pig iron disposed of by the furnace interests, especially of malleable grades. In the entire month, it is estimated that 45,000 tons of malleable was sold in the Chicago district. The buying in the past few days has been of a quiet character, some consumers apparently picking out a producer whose iron met their requirements, and placing the order, without doing any shopping in the market. The Illinois Malleable Iron Co. is said to have picked up 9,000 tons by the simple expedient of asking for prices on one or two thousand tons, and accepting a number of offers. It is understood that the Michigan charcoal iron furnaces put up a lively competition for some of the malleable business which was offered last week, and that quotations were shaded in order to be in line for a portion of the orders. Part of the iron sold to a Racine melter was charcoal iron. A quotation of $19.25, Chicago, made by some of the charcoal interests, subsequently was withdrawn, and quotations on this class of iron now are made at $19.50 for the first quarter; $19.75 for the second; and $20.50 for the last half of the year. On southern foundry iron, there are some sellers who are willing to take business for the third quarter at $14.00, Birmingham, and one sale of 2,500 tons of Pioneer iron is reported at that figure, for second and third quarters, but for third quarter alone, the same interest is holding at $14.50. This seems to be the attitude taken by most of the furnaces—to accept business for the first half at the even figure of $14.00, but to charge an advance for any delivery later than July 1. Other furnaces remain out of the market, by holding their iron at $15.00.

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|---|---|
| Lake Superior charcoal | $19.50 to 20.00 |
| Northern foundry No. 2 | 19.00 to 19.50 |
| Southern foundry No. 2 | 18.35 to 18.85 |
| Southern silveries, 5 per cent silicon | 19.40 to 19.90 |
| Jackson Co. silveries, 8 per cent. | 22.40 to 22.90 |
| Malleable Bessemer | 19.00 to 19.50 |
| Alabama basic | 18.85 to 19.35 |

**Billets.**—There is a continued scarcity of billets to report this week, and manufacturers who are able to take advantage of the business which is offered are in a fortunate position and may name prices which are very attractive, from a selling point of view. An eastern steel company reports a sale of 250 tons of rolling billets the past week at a price in advance of quotations which have been ruling previously. Local makers have no billets for the market, and it is a difficult matter to name a figure which will properly represent the present situation, but a nominal quotation probably would be $33, or even higher.

**Merchant Bars.**—The closing days of last month were not remarkable for any great activity in new buying in iron and steel, although there was a very respectable scattering of fair-sized orders, for delivery several weeks ahead. The local mills are not yet anywhere near being caught up with their orders. Specifications have been submitted for entry at a satisfactory rate, and still are coming in in excess of rolling capacity. Store business has been and is very good, but there is no change in prices, either from mill or store.

We quote, Chicago delivery, as follows:

Bar iron, 1.60c to 1.65c; hard steel bars, re-rolled, 1.60c to 1.65c; soft steel bars and bands and small shapes, 1.68c to 1.78c, base; hoops, 1.78c to 1.88c; planished or smooth finished tire steel, 1.88c to 1.93c; iron finish, up to 1½ by ½ inch, 1.83c base, tire card; iron finish, 1½ by ½ inch and larger, 1.68c, base, bar card; channel for solid rubber tires, ¾ to 1 inch, 2.18c, flat, and 1⅛ inches and larger, 2.08c, flat; smooth finished machinery steel, 1 inch and larger, 2.43c; flat sleigh shoe, 1.73c; toe calk steel, 2.23c; spring steel, 2.28c; crucible spring steel, 2.78c; tool steel, 7c to 9c, with higher prices for special grades. Quotations on shafting are 55 per cent off the list for carload lots, and 50 per cent off for less than carload lots, carload freight allowed to points in base territory.

On iron and steel bars from local stocks, we quote, as follows: Bar iron, 2c to 2.10c, base; soft steel bars, 1.90c to 2c per 100 pounds, base; soft steel hoops, 2.40c to 2.50c, full extras.

**Rails and Track Supplies.**—Specifications on orders in this line have been very heavy, and much exceed the rate at which tonnage is being rolled. Sales of spikes and bolts have been large. The local interest booked orders for standard rails amounting to 17,000 tons, during the past week, and there is a large tonnage awaiting the signatures of the interested parties. Light rail trade is quiet.

See Pittsburg report for prices on standard sections.

On light rails, Chicago delivery, we quote as follows: Light rails, 40 and 45-pound, $27; 30 and 35-pound, $27.75; 16, 20 and 25-pound, $28; 12-pound, $29.

Track supplies, f. o. b. Joliet, angle bars, 1.50c to 1.60c; railroad spikes, 1.85c to 1.95c; smaller size spikes, 1.90c to 2.00c, base; track bolts with square nuts, 2.40c to 2.60c, base; with hexagon nuts, 2.55c to 2.75c.

**Structural Material.**—The amount of business moving in this line is not large at present, but there are numerous orders involving small tonnages which come in with considerable regularity. During the month of January there was booked by fabricators about 100,000 tons, of which the American Bridge Co. took a little less than 40,000 tons, and the independent interests a little over 60,000. The Pennsylvania Steel Co. secured an order for 950 tons for the Pend d'Oreille bridge, in Idaho, on the Idaho, Washington & Northern railway, a coast extension line of the St. Paul system. The American Bridge Co. booked an order for a girder bridge for an elevated crossing at Spokane, Wash., requiring 238 tons. The contract for the ore dock at Allouez bay probably will not be let for a week or ten days.

We quote mill prices for structural shapes, Chicago delivery, as follows:

Beams and channels, 15-inch and under, 1.78c to 1.88c. For extras see Pittsburg report.

Local store prices are as follows: All angles, 3 inches and larger, including 6 inches, $2 to $2.10 per 100 pounds; angles over 6 inches, $2.10 to $2.20 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $2 per 100 pounds, base; channels, 3 inches and larger, $2 per 100 pounds, base.

**Plates.**—The month which has just closed is usually a dull one, and this year it has been no exception so far as new business is concerned, compared with some of the immediately preceding months. However, manufacturers have not been anxiously looking for business, as their mills are sufficiently employed for some time to come. Locomotive shops have been buying steel plates out of store, and with their other business some of the jobbers have been doing a record-breaking trade. December established a record which exceeded everything up to that time, but January passed even that high mark in jobbers' history.

We quote, Chicago delivery, as follows: Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.78c to 1.88c. For extras see Pittsburg report.

Store quotations are without change as follows: Tank steel, ¼ inch and heavier, up to 72 inches wide, 2c to 2.10c; from 72 inches to 96 inches wide, 2.10c to 2.20c; 3-16 inch up to and including 60 inches wide, 2.10c to 2.20c; 72 inches, 2.35c to 2.45c; No. 8 up to 60 inches wide, 2.15c to 2.25c. Flange and head quality, 25c extra.

**Sheets.**—Previous orders on hand will carry the mills along for several weeks, and sales departments are not pushing the business as they are sold as far ahead as they wish to be at present. Some of the eastern interests have advanced their prices on galvanized sheets $1 per ton, and it is said that some mills are securing from $1 to $3 per ton premium over current quotations for prompt shipment.

For mill prices see Pittsburg report. Freight to Chicago, 18 cents.

We quote store prices at Chicago as follows: No. 10, 2.25c to 2.35c; No. 12, 2.30c to 2.40c; No. 14, 2.35c to 2.45c; No. 16, 2.45c to 2.55c; Nos. 18-20, 2.80c to 2.90c; Nos. 22-24, 2.85c to 2.95c; No. 26, 2.90c to 3c; No. 27, 2.95c to 3.05c; No. 28, 3c to 3.10c; No. 30, 3.30c; galvanized sheets, Nos. 10 and 16, 3.20c to 3.30c; Nos. 18 and 20, 3.35c to 3.45c; Nos. 22 to 24, 3.50c to 3.60c; No. 26, 3.50c to 3.80c; No. 27, 3.90c to 4c; No. 28, 4.10c to 4.20c; No. 30, 4.50c to 4.60c.

**Wire Products.**—A very promising trade is looked for, as spring approaches. Present demand is fully up to the average for the season, and prices are firmly maintained. The present season is one in which no heavy business is expected, but the revival of buying may be counted upon to put in an appearance in a very few weeks.

We quote, Chicago delivery, as follows: Wire nails, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; painted barb wire, jobbers' carload lots, $2.03; retailers' carload lots, $2.08; retailers' less than carload lots, $2.18; with 30c for galvanizing; plain wire to jobbers, carload lots, $1.83; staples, bright, $2.03.

**Merchant Pipe.**—Trade is quiet in this line, as is usual at this time of the year. Considerable buying of plates from store by locomotive builders is reported, and general jobbing business is in excellent shape.

For mill discounts, see Pittsburg report.

We quote, out of store, as follows: Wrought steel pipe, black, ⅛-inch to ¼-inch, 68 per cent; ⅜-inch, 69 per cent; ½-inch, 72 per cent; ¾-inch to 6-inch, 76 per cent; 7-inch to 12-inch, 68 per cent. Iron pipe, about 6 points higher.

Lap-welded steel tubes, 2¾-inch to 5-inch, 60 to 62 per cent; charcoal iron tubes, 2¾-inch to 4-inch, 48 to 50 per cent; seamless steel tubes, 2¾-inch to 4-inch, 46 per cent.

**Cast Iron Pipe.**—The total of business moving in this line at present is not large, and only one municipal contract is in sight. This is for 4,200 tons, mostly small sizes, for the city of Detroit, and will be let Feb. 8. Small orders for water and gas pipe constitute the bulk of current business.

We quote as follows: 4-inch water pipe, $28.50; 6 to 16 inches, $27.50; larger sizes, $26.50; gas pipe, $1 a ton higher.

**Old Material.**—The situation in the scrap market is about the same as at last report. Some specialties have a stronger tone, and are higher, but the ordinary lines of old material, being neglected, are weaker. We quote, gross tons, as follows:

| | |
|---|---|
| Old car wheels | $18.00 to 18.50 |
| Old iron rails | 18.50 to 19.00 |
| Rerolling rails (4 ft. and over) | 17.75 to 18.25 |
| Old steel rails (2 ft. and under) | 16.50 to 17.00 |
| Light section relayers, 45 lbs. and under, subject to inspection | 21.00 to 23.00 |
| Relaying rails, subject to inspection | 24.50 to 25.00 |
| Frogs, switches and guards | 15.50 to 16.00 |
| Heavy melting steel | 15.50 to 16.00 |
| Shoveling steel | 15.00 to 15.50 |

We quote, net tons, as follows:

| | |
|---|---|
| No. 1 R. R. wrought | $14.75 to 15.25 |
| No. 2 R. R. wrought | 13.75 to 14.25 |
| Arch bars and transoms | 17.75 to 18.25 |
| Knuckles, couplers and springs | 14.25 to 14.75 |
| Shafting | 17.50 to 18.00 |
| Iron car axles | 22.00 to 22.50 |
| Steel car axles | 22.50 to 23.00 |
| Locomotive tires | 18.00 to 18.50 |
| Dealers' forge | 12.25 to 12.75 |
| Pipes and flues | 11.00 to 11.50 |
| No. 1 cast, 150 lbs. and less | 15.00 to 15.50 |
| No. 1 busheling | 12.75 to 13.25 |
| No. 2 busheling | 9.50 to 10.00 |
| No. 1 boiler cut | 11.25 to 11.75 |
| Boiler punchings | 16.00 to 16.50 |
| Cast and mixed borings | 7.50 to 8.00 |
| Machine shop turnings | 10.50 to 11.00 |
| Railroad malleable | 14.50 to 15.00 |
| Agricultural malleable | 12.75 to 13.25 |
| Stove plate and light cast scrap | 12.25 to 12.75 |
| Angle bars, splices, etc. (iron) | 17.25 to 17.75 |
| Angle bars, steel | 15.25 to 15.75 |

## CLEVELAND.

### Weakness in Foundry Pig Iron and Spot Furnace Coke.

Office of THE IRON TRADE REVIEW,
Browning Building, Feb. 1.

**Iron Ore.**—Following the recent heavy buying, there is little activity at present, but it is expected that in the early spring months eastern consumers will come into the market for two or three million tons of ore.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $5; Mesabi Bessemer, $4.50; old range non-Bessemer, $4.20; Mesabi non-Bessemer, $4.

**Pig Iron.**—There is some weakness in foundry iron, and brokers are offering No. 2 for prompt shipment at $16.50 to $16.75 valley. Furnaces, however, are not making such large concessions. There is general belief that a quiet market will prevail throughout February, but that buying will start in after this month, or at least by the first of April.

In spite of recent determined attempts to depress the basic pig iron market, prices are being well maintained. As evidence of the falsity of recent reports concerning a sale of basic at Pittsburg, the case of a Canton buyer, well known for his astuteness in business, is cited. The Canton concern was in the market for 6,000 tons of basic for last half delivery, and not a single valley furnace or Pittsburg broker quoted lower than $17, valley furnace, nor was less than $17 at the furnaces which took the business paid. This is accepted by the trade as conclusive evidence that the report of the sale of 24,000 tons of basic at considerably below the market figures was founded on nothing more than a trade for billets, both pig iron and crude steel being put in at lower than the prevailing market prices.

We quote delivered in Cleveland as follows:

| | |
|---|---|
| No. 1 foundry | $17.75 to 18.25 |
| No. 2 foundry | 17.50 to 17.75 |
| No. 2 Southern | 18.35 |
| Gray forge | 17.15 |
| Bessemer | 19.90 |
| Lake Superior charcoal | 19.50 |
| Jackson Co. 8 per cent silvery | 20.55 |

**Coke.**—Considerable softness has developed in the coke market, especially in spot furnace. As low as $2.25 for furnace coke for immediate delivery has been quoted, but possibly this can not be done on standard grades. For prompt delivery, we quote Connellsville furnace coke $2.25 to $2.50 and for first half, $2.50 to $2.60, with foundry coke at $3 for prompt delivery, and $3.25 to $3.35 for first half.

**Finished Materials.**—Some inquiry has developed from agricultural implement manufacturers who are anxious to make contracts for their requirements after July 1, but mills are not disposed to contract for that period. There is not as great activity in placing new business on most materials as there was some time ago. Owing to the heavy specifying prior to Jan. 1, many consumers find themselves well supplied with material and are slow to make any additional purchases. Some of the independent sheet manufacturers are showing more disposition to seek business and better deliveries are being given. Plate mills in the east which have been selling in this territory at 1.79c Cleveland do not find it as easy to take business. Considerably better delivery is being given in some sizes of structural material by several independent companies.

The contract for the structural steel for a foundry building for the Erie Engine Works, Erie, Pa., has been awarded to the Riverside Bridge Co., Martins Ferry, O., between 400 and 500 tons of steel being required. The steel fabricating contract for the Ontario street addition to the May Co. building in this city has been let to the Republic Structural Iron Co., of Cleveland. The Cambria Steel Co. will furnish the steel, about 400 tons, in which are included some Bethlehem sections. A purchase of 1,200 tons of plates for delivery at the rate of 300 tons per month, through March, April, May and June, has been made by a Cleveland territory consumer, upon which the regular price of 1.55c, Pittsburg, is paid.

**Old Material.**—Consumers of scrap in this market continue their policy of not buying at present prices, and there is little or no movement of old material. What tendency there is appears to be toward lower prices. Old iron rails are weaker, and prices have been marked down 50c a ton. We quote gross tons f. o. b. Cleveland as follows:

| | |
|---|---|
| Old iron rails | $18.50 to 19.00 |
| Old steel rails (under 6 feet) | 17.00 to 17.50 |
| Old car wheels | 17.50 to 18.00 |
| Old steel boiler plate | 14.00 to 14.50 |
| Malleable iron (railroad) | 17.00 to 17.50 |
| Steel axles | 20.00 to 20.50 |
| Malleable iron (agricultural) | 15.00 to 15.50 |
| Heavy steel | 16.00 to 16.50 |
| Country mixed steel | 14.00 to 14.50 |

We quote, net tons, as follows:

| | |
|---|---|
| No. 1 R. R. wrought | $16.00 to 16.50 |
| No. 1 busheling | 14.00 to 14.25 |
| No. 1 machine cast | 15.00 to 15.50 |
| Axle turnings | 11.00 to 12.00 |
| Machine shop turnings | 10.00 to 10.50 |
| Grate bars | 12.00 to 12.50 |
| Pipes and flues | 12.00 to 12.50 |
| Tank iron | 11.50 to 12.00 |
| Sheet iron | 6.50 to 7.00 |
| Wrought drilling | 10.50 to 11.00 |
| Stove plate | 13.00 to 13.50 |
| Cast borings | 8.00 to 8.50 |

## CINCINNATI.

### Tonnage of Malleable Sold—Southern Prices for Last Half Softening.

N. E. cor. Fourth and Elm Sts., Feb. 1.

**Pig Iron.**—Demand for malleable continues to be the feature of the iron market, and reports show a large tonnage having been sold. Foundry grades, while perhaps not particularly active, have been in fair demand, and agents report a sprinkling of small orders that total some tonnage. In this immediate territory, there has been no inquiry for anything of any size, local foundries and other melters being apparently well covered throughout this half and probably in some instances into next. Quotations for prompt shipment and through first quarter are being well maintained and are $14, Birmingham, for southern, and $17, Ironton, for northern brands. The situation, however, from July 1, appears to have softened somewhat, and while a number of southern furnaces are quoting $14.50 for this delivery, there is apparently little doubt that a firm offer would develop a $14 price, at which figure some tonnage has been sold. There was a sale of 1,600 tons of malleable for third quarter and last half at $17, Ironton, and 300 tons of southern charcoal at $22, furnace, which appears to be the established price for these brands. Eight per cent silvery is fairly strong at $20, furnace, with demand quiet. We quote for prompt delivery and delivery over last half of 1910, based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, as follows:

| | |
|---|---|
| Southern foundry No. 1 | $17.75 to 18.25 |
| Southern foundry No. 2 | 17.25 to 17.75 |
| Southern foundry No. 3 | 16.75 to 17.25 |
| Southern foundry No. 4 | 16.75 to 17.00 |
| Southern No. 1 soft | 17.75 to 18.25 |
| Southern No. 2 soft | 17.25 to 17.75 |
| Southern gray forge | 16.50 to 16.75 |
| Northern No. 1 foundry | 18.70 |
| Northern No. 2 foundry | 18.20 |
| Northern No. 3 foundry | 17.70 |
| Jackson county 6 per cent silicon | 20.20 |
| Jackson county 8 per cent silicon | 21.20 |
| Jackson county 10 per cent silicon | 22.20 |

**Coke.**—Demand for both foundry and furnace brands is quiet and the market is featureless. Foundries are said to be taking coke on contract as rapidly as received, and little is being done in the way of future business. Prices are fairly well established and holding firm. Prices in the leading coke producing districts are as follows:

| | Prompt shipment. | First half 1910. |
|---|---|---|
| Connellsville district: | | |
| Foundry coke | $3.00 to 3.25 | $3.00 to 3.25 |
| Furnace coke | 2.50 to 2.60 | 2.65 to 2.75 |
| Wise county district: | | |
| Foundry coke | 2.75 to 3.00 | 3.00 to 3.25 |
| Furnace coke | 2.10 to 2.25 | *Sliding [scale basis. |
| Pocahontas district: | | |
| Foundry coke | 2.75 to 2.90 | 2.85 to 3.10 |
| Furnace coke | 2.50 to 2.75 | 2.75 |
| New River: | | |
| Foundry coke | 2.75 to 3.00 | 2.90 to 3.25 |
| Furnace coke | 2.25 to 2.50 | 2.35 to 2.50 |

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

**Finished Material.**—Specifications are developing rather slowly, and the demand along new lines is said to be a little quiet. There appears to be little improvement in the manner in which mills are handling business already booked, and the general situation is unchanged. Steel bars and small shapes sold on steel bar card are quotable at 1.50c, base Pittsburg, and plates and structural, 1.60c, net Pittsburg.

**Old Material.**—There appears to be no demand along any particular line for the various scrap offerings, and the market is quiet and dull. Dealers say that if they make concessions, they are able to dispose of their iron, but the mills are not actively seeking their stock. We quote dealers' prices as follows:

| | |
|---|---|
| tons | $13.50 to 14.00 |
| No. 1 machinery, net tons | 13.50 to 14.00 |
| No. 1 busheling, net tons | 12.00 to 13.00 |
| Old iron rails, gross tons | 18.00 to 18.50 |
| Old steel rails (re-rolling), gross tons | 17.00 to 17.50 |
| Old short lengths, gross tons | 15.00 to 16.00 |
| Old iron axles, net tons | 19.00 to 19.50 |
| Heavy melting scrap, gross tons | 14.50 to 15.00 |
| Stove plate, net tons | 10.00 to 10.50 |
| Heavy turnings, net | 9.50 to 10.00 |
| Cast borings, net tons | 7.50 to 8.00 |
| Car wheels | 15.50 to 16.00 |
| Grate bars | 12.00 to 12.50 |

Surveyors are locating the proposed site of the Velte Foundry & Machine Co., at Mars, Butler county, Pa., along the B. & O. railroad. The Velte company recently sold its Pittsburg property to the Heppenstall Forge & Knife Co. The new plant will be larger than the old, and will probably be occupied in several months.

## BUFFALO.

### Fair Inquiry for Pig Iron—Implement Manufacturers Busy.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Feb. 1.

**Pig Iron.**—The week opens with only a fair inquiry. Business is quiet. Many of the big consumers are not inquiring for prices today, they, apparently, having covered urgent needs. Buying for last half deliveries has subsided somewhat. There is no depression in the market, the trend being rather toward optimism. There has been a strong call for malleable for several weeks and the business done in this grade continues important. The malleable consumers have been very active and it has tightened prices somewhat. The change in malleable quotations averages about 25c, the price having advanced to $17.50, certain interests quoting $18 Buffalo. We quote for last half deliveries, at furnace, as follows:

| | |
|---|---|
| No. 1X foundry | $17.75 to 18.00 |
| No. 2X foundry | 17.25 to 17.50 |
| No. 2 plain | 17.00 to 17.25 |
| No. 3 foundry | 17.00 to 17.25 |
| Gray forge | 16.75 to 17.00 |
| Malleable | 17.50 to 17.75 |
| Basic | 18.25 to 18.75 |
| Charcoal | 20.00 to 21.00 |

**Finished Products.**—There is little new business of note. Mills are still running behind on orders and contract customers are coming out a little more freely with specifications. Bids were opened Jan. 29 for furnishing the structural in the proposed extension of the Otis Elevator plant in this city. The tonnage is 600 of fabricated structural. The contract, it is said, will be awarded this week. One of the important points considered by the trade at this time is the activity of nearly all the agricultural implement manufacturers who are now pressing the mills not only for material previously contracted for but for supplementary tonnage. They find they are 25 per cent short on material and are now asking the interests for preference owing to the urgent call upon them for their products. This statement also applies to the Canadian manufacturers of the same class who are calling upon the American interests to help them out at once. They are asking for heavy tonnage, pressing hard for early delivery.

**Old Material.**—There has been no change in quotations the past week. The nominal prices named below represent the market at this point as comprehensively as is possible under present conditions. Business is dull. The big consumers are inactive and it is generally believed they have plenty of tonnage on hand to meet their requirements for several weeks. We quote, f. o. b. Buffalo, gross tons, as follows:

| | |
|---|---|
| Heavy melting steel | $16.50 to 17.00 |
| No. 1 railroad wrought scrap | 18.00 to 18.50 |
| No. 1 railroad and machine cast scrap | 16.50 to 17.00 |
| Old steel axles | 21.00 to 21.50 |
| Iron axles | 26.00 to 26.50 |
| Car wheels | 18.00 to 18.50 |
| Railroad malleable scrap | 16.50 to 17.00 |
| Machine shop turnings | 11.25 to 11.75 |
| Cast iron borings | 9.25 to 9.75 |
| Low phosphorus steel scrap | 20.00 to 21.00 |
| Old iron rails | 19.00 to 20.00 |
| Tank iron | 13.50 to 14.00 |
| Sheet iron | 9.00 to 9.50 |
| Stove plate | 13.50 to 14.00 |
| Pipe and flues | 13.50 to 14.00 |
| Grate bars | 12.00 to 12.50 |
| Boiler plate | 14.00 to 14.50 |

## ST. LOUIS.

### Sales of 10,000 Tons of Southern Iron Made—Other Inquiries Pending.

Feb. 1.

**Pig Iron.**—Sales of malleable and gray iron aggregating upwards of 10,000 tons were made in the St. Louis territory last week, and inquiries were received for from 4,000 to 5,000 tons of southern No. 1 and No. 2 for shipment over the second quarter and last half.

In addition to this, one large buyer, while not actually in the market, frankly admits that his concern will have to cover for its needs over the last half of the year for 15,000 to 20,000 tons of basic, and that a sale may be made at any time that he believes the price is right. Today an inquiry was received for 1,000 tons of southern foundry for last half, as well as 300 or 400 tons for immediate delivery. Orders were freely placed last week at $14, Birmingham basis, for No. 2, for shipment over the first and second quarter, as well as for last half, the price for last half being quoted by some as high as $14.50. Other agents insist that their firms have instructed them not to let any business get away at a figure a little less than $14 for No. 2, southern pig iron, and to apply the same rule in shading coke prices, if necessary. Malleable Bessemer is firm at $17, Ironton, for all deliveries. Ohio foundry is quoted at $16.50 to $17, Ironton. Prices for southern iron, delivered, to which the Birmingham freight of $3.75 has been added, follow:

| | |
|---|---|
| No. 1 foundry | $ 18.25 |
| No. 2 foundry | 17.75 |
| No. 3 foundry | 17.25 |
| No. 4 foundry | 16.75 |

**Coke.**—The market is quiet in the St. Louis territory, orders being placed for the best-selected Connellsville 72-hour foundry grades at $3 to $3.25 and at $3.50 in some instances. There are no inquiries out for any large tonnages of coke, buyers seeming to prefer to wait until the market for the new year develops a little more fully. Connellsville 48-hour furnace coke is quoted at $2.65 to $2.85, ovens, for all deliveries. Virginia 72-hour foundry grades are held at $3 to $3.25 for all deliveries, while Virginia 48-hour furnace coke is offered at $2.25 to $2.50, with some ovens holding out for $2.85 to $3, it is understood. The price on by-product coke, St. Louis, is $5.80 for all deliveries. The freight on coke to St. Louis and East St. Louis is $2.80, and $2.70 from Virginia fields when shipment is destined beyond St. Louis.

**Old Material.**—The scrap iron market remains dull, with prices as follows:

| | |
|---|---|
| Old car wheels | $17.00 to 17.50 |
| Old iron rails | 19.00 to 20.00 |
| Rerolling rails (4 ft. and over) | 16.75 to 17.25 |
| Old steel rails (2 ft. and under) | 16.50 to 17.00 |
| Light section relayers, 45 lbs. and under, subject to inspection | 21.00 to 23.00 |
| Relaying rails, subject to inspection | 24.50 to 25.00 |
| Frogs, switches and guards | 15.50 to 16.00 |
| Heavy melting steel | 15.50 to 16.00 |
| Shoveling steel | 14.00 to 14.50 |

We quote, net tons, as follows:

| | |
|---|---|
| No. 1 R. R. wrought | $14.50 to 15.00 |
| No. 2 R. R. wrought | 13.50 to 14.00 |
| Arch bars and transoms | 17.50 to 18.00 |
| Knuckles, couplers and springs | 15.00 to 15.50 |
| Shafting | 17.00 to 17.50 |
| Iron car axles | 20.00 to 21.00 |
| Steel car axles | 20.00 to 21.00 |
| Locomotive tires | 18.00 to 18.50 |
| No. 1 country wrought | 12.25 to 12.75 |
| Pipes and flues | 11.75 to 12.00 |
| No. 1 cast, 150 lbs. and less | 14.00 to 14.50 |
| No. 1 busheling | 13.00 to 13.50 |
| No. 2 busheling | 9.75 to 10.25 |
| No. 1 boiler cut | 11.50 to 12.00 |
| Boiler purchings | 13.00 to 14.00 |
| Cast and mixed borings | 7.50 to 8.00 |
| Machine shop turnings | 10.75 to 11.25 |
| Railroad malleable | 13.25 to 13.75 |
| Agricultural malleable | 11.50 to 12.00 |
| Stove plate and light cast scrap | 11.50 to 12.50 |
| Angle bars, splices, etc. (iron) | 17.25 to 17.75 |
| Angle bars, steel | 15.50 to 16.00 |

## BIRMINGHAM, ALA.

### Sales of Small Lots of Southern Pig Iron—Report of Large Sale Not Confirmed.

Birmingham, Ala., Jan. 31.

**Pig Iron.**—Sales effected in this market during the past week consist largely of comparatively small lots, but the aggregate is fairly attractive. It has been reported that a leading interest recently sold 20,000 tons for delivery covering the remainder of the year, but such a sale cannot be confirmed and so far as is known the actual commitments for delivery after July 1 represent but a small portion of the probable make. Current quotations have not changed since last report. For early delivery, the $14 per ton schedule is available and can probably be made to apply to shipments through the second quarter. For strictly second quarter shipments,

it is not believed that lower figures than $14.50 per ton are available. The majority of producers have manifested a disposition to accept orders for shipment during the third quarter and have in the largest number of cases quoted $14.50 per ton, Birmingham. That price might be made applicable to shipments covering the last half, but so far no quotations on strictly fourth quarter shipments are known to have been elicited. The number of inquiries increase and selling agencies are disposed to discredit former reports that the trade had been largely provided for against first half requirements through engagements during last year. But the actual melt has not increased at the rate expected and it is known that a good portion of iron now being moved is being stored on purchasers' yards. No statistics are yet available as to accumulations now on furnace and warrant yards, although it is supposed that a reduction has been effected during the month of January. Considerable credence is being given current reports that the largest producer in this district will soon operate all foundry iron capacity on basic iron. With such a change, it is the opinion of the best authorities that the foundry iron production would be materially short of requirements early in the second half, as but a small percentage of capacity now idle for repairs will be ready for operation by that time. The decrease in output of foundry iron since Dec. 1 is estimated at from 25,000 to 30,000 tons.

## SEATTLE.

### Troublesome Factors Removed—Pig Iron Market is Quiet.

Office of THE IRON TRADE REVIEW,
302 Pioneer Bldg., Jan. 28.

In all departments of the iron and steel trade of the north Pacific coast a much smoother condition prevails at the present time than for some weeks past. Many of the factors which were impeding progress in the recent past, the switchmen's strike, bad weather, local floods, depleted stocks, a slightly clouded labor horizon, etc., are practically cleared away. January business in finished lines has exceeded all previous records. The foundry trade is more hopeful but is still quiet. A number of sizeable contracts for building castings were closed during January at prices ranging from 2¼ to 2⅜ cents per pound. Prices for ordinary machinery castings are still lagging. Wire interests are recording a very encouraging volume of business. The American Steel & Wire Co. will occupy its new Seattle warehouse April 1. The 1909 exports of tin plate to Alaska exceeded 12,000 tons, practically all of the tonnage being absorbed by the salmon can manufacturers. This year's tin plate specifications will be heavy although somewhat less than those of 1909. Some consumers have been diffident about coming into the market and are now finding difficulty in covering their requirements.

**Pig Iron.**—Consumers are generally covered for the first half requirements, while sellers are not disposed to quote on tonnage for delivery beyond July. Slight improvement is noted in the foundry trade and scattering purchases are being made of spot iron but the situation is generally quiet. Some high silicon iron is being offered at attractive prices. A very favorable market from the consumer's standpoint continues. We quote gross tons as follows, foreign iron ex ship Puget Sound or Columbia river, domestic f. o. b. Pacific Coast terminals:

| | |
|---|---|
| No. 1, English Jarrow, spot | $24.00 to 24.50 |
| No. 1, Chinese, Han Yang, spot | 23.00 to 23.50 |
| Glengarnock, Scotch, to arrive June-July | 24.50 to 25.00 |
| No. 1 English, Jarrow, to arrive June-July | 23.50 to 24.00 |
| English, 4 to 5 per cent silicon, to arrive May-June | 23.50 to 24.00 |
| Southern No. 2, domestic | 24.75 to 25.25 |

**Merchant Iron.**—The country trade is buying bars with more caution, for which reason the consumption is less well distributed at present. Traffic conditions are assuming less importance. Some shading, amounting to 5 cents per 100 pounds, on steel bars is noted. Business in reinforcing bars continues heavy and shows no sign of abating. The Pacific Hardware & Steel Co., San Francisco, has announced the construction of a new warehouse at Portland, Ore., which will be rushed to completion; tentative plans for a new warehouse in Seattle for the same interest are under consideration. We quote base prices as follows, f. o. b. Seattle: Common iron bars, $2.30; soft steel bars, $2.50; machinery steel, $2.85; Norway iron, $3.75; angles, channels, beams and tees, under 3 inches, $2.75 to $2.80.

**Sheets.**—A number of heavy orders have been noted during the past week and the trade in both blue annealed and galvanized sheets continues very active. January business eclipsed all previous local records. The market is very stiff and except for large tonnages of attractive business no discounts from the standard prices are obtainable. We quote, as follows, f. o. b. Seattle: Blue annealed sheets, No. 12, 3.30c; No. 14, 3.35c; No. 16, 3.45c; No. 18, 3.90c; Nos. 22 to 24, 3.95c; No. 28, 4.10c; galvanized sheets, Nos. 12 to 14, 4.10c; No. 16, 4.20c; Nos. 18 to 20, 4.50c; Nos. 22 to 24, 4.65c; No. 26, 4.85c; No. 28, 5.35c; No. 30, 5.95c.

**Old Material.**—There is some foundry inquiry for choice cast scrap and foundry purchases of scrap steel are being maintained. It is expected that the Western Steel Corporation, which intends to open the new plant at Irondale in March, will soon be in the market for a round tonnage of melting steel. We continue to quote in net tons, f. o. b. Seattle:

| | |
|---|---|
| Foundry scrap, No. 1 grade | $18.00 to 19.50 |
| Foundry scrap, No. 2 grade | 16.00 to 16.50 |
| Old car wheels | 16.50 to 17.00 |
| Railroad wrought | 10.00 to 11.00 |
| Miscellaneous steel scrap | 5.00 to 9.00 |

## NEW YORK.

### Pig Iron Market Dull—Hesitancy in Finished Material.

Office of THE IRON TRADE REVIEW,
Room 1005, No. 90 West St., Feb. 1.

**Iron Ore.**—According to reports from unofficial sources, the import movement during January was in excess of 300,000 tons, of which about one-half was through the Philadelphia port. At New York, receipts were about 50,000 tons and at Baltimore over 100,000 tons came in over the docks of the larger Cuban interest alone. This is the heaviest movement on record, but is likely to be followed by a period of comparative quiet, as trans-Atlantic charters have advanced and are now from 9s 7d to 10s, depending on the nature of the shipping port. Owing to the severe weather, the winter so far has offered greater difficulties in the way of unloading ore than ever before, with the result that domestic miners have been forced to postpone shipments on contracts beginning with the year. We note the sale of a 5,000-ton cargo of Spanish ore at an advance of one-half cent per unit over prices recently prevailing.

**Pig Iron.**—Conditions are unsettled and prices ragged, raging within wide limits Considerable business is being taken, but only by those interests which are offering iron on the lower basis to which the market has settled during the past two or three weeks. Virginia product is selling freely for first half delivery on a basis of $15.50, furnace, the leading producer making this price in order to clear up a part of the accumulations on its banks preparatory to blowing in two additional stacks. In eastern Pennsylvania the general holding price is now $18.00, furnace, but this figure is being shaded at least 50 cents per

ton, and one interest has sold into New England as low as $17.25, furnace. Those interests, which have not come down to this level, are closing practically nothing, and southern iron is again out of this market; this condition is illustrated by the quotations submitted during the week on a good tonnage for a New England consumer, the range being $19.25 to $21.45, delivered. Current selling includes foundry iron aggregating a good tonnage, some coke malleable, a little low phosphorus iron containing copper, two or three small blocks of charcoal and considerable low grade iron for pipe foundries and puddle mills. The leading electrical interest is still in the market for its eastern works. We quote, delivered at New York tidewater over the first half, as follows:

| | |
|---|---|
| Northern foundry No. 1 | $19.00 to 19.50 |
| No. 2X foundry | 18.50 to 19.00 |
| No. 2 plain | 18.00 to 18.50 |
| No. 2 southern foundry | 18.25 to 18.75 |
| Malleable | 19.25 to 19.75 |
| Gray forge | 17.00 to 17.50 |

**Ferro-Alloys.**—Inquiries are current for about 1,200 tons of ferro-manganese and sales of 300 tons have been made at the market, which continues at $44 to $44.50, seaboard. There is no activity in ferro-silicon and prices are unchanged.

**Finished Materials.**—Activity in the market for finished lines is rather light and the situation shows much hesitancy upon the part of buyers. Prices are being fairly well held and are probably the least firm in shapes, where there are reports that large tonnages would likely command about 1.50c, Pittsburg. Structural lettings are only fair, but a better inquiry this week is reported from some sources. The railroads are not coming forward with a great amount of work at this time, but there are a few contracts being placed. The Pennsylvania Steel Co. has taken 950 tons for the Idaho & Washington Northern and the Lackawanna Bridge Co. 600 tons for the Kansas City Southern. The American Bridge Co. has closed for 200 tons of bridge work for the Lackawanna & Northern, 200 tons for the Pennsylvania and 200 tons for the Spokane & Inland Empire railroad. The Chicago & Northwestern has also placed a small order with the Kenwood Bridge Co. and the Pennsylvania a small lot with the Phoenix Iron Co. The New Haven has let a small bridge to the Phoenix Iron Co. at Sandy Hook, Conn., and is in the market for 2,000 tons for stations and track elevation work at Worcester, Mass. Other lettings include the Moore mercantile building, San Antonio, Tex., 1,100 tons, to the Phoenix Iron Co., 1,600 tons to A. Norton & Co. for a loft building on Twentieth street, this city, for the Fabien Construction Co., in which Bethlehem shapes are specified, 400 tons to Milliken Bros. & Co., Inc., for a loft building on West Nineteenth street, and two apartment houses of about 400 tons each, this city, to the Passaic Steel Co. Among the business in prospect are two large buildings on Fourth avenue, this city, to be erected by the Germania Insurance Co. and Mills & Gibbs, and a bakery in Bronx for the Ward Baking Co., 1,500 tons. A hotel on West Forty-sixth street will take 300 tons. It is anticipated that further subway construction will shortly be advanced and this will require a large tonnage. The Oliver Mfg. Co., Knoxville, Tenn., is out for 1,800 tons of shapes for dump cars for Isthmian canal work, which includes considerable plate tonnage in addition. New car building is lacking, but some of the steel car plants are sold up far ahead, a notable case being that of the Berwick plant of the American Car & Foundry Co., the largest steel works of this interest, which is booked full to the middle of August. We quote, New York delivery, as follows:

Angles, 3 to 6 inches x ¼-inch and heavier, 1.66c to 1.76c; beams, 3 to 15 inches, 1.66c to 1.76c; tees, 3 x ¼-inch and heavier, 1.66c to 1.76c; plates, carload, tank, 1.66c to 1.76c; marine boiler, 2.06c to 2.16c; bar iron, 1.70c to 1.80c; soft steel bars, 1.61c to 1.71c; sheets, No. 28, black, 2.46c.

**Cast Iron Pipe.**—There is promise of considerable tonnage being placed soon in New York City and immediate vicinity, but the present conditions of the cast iron pipe market as to new lettings are not very active. Some business, however, is being quietly placed. Reports from New England that contracts recently placed in that vicinity have been taken largely by the Utica Pipe Foundry, Utica, N. Y.. No large lots are included.

**Old Materials.**—Rolling mill materials are moving, but in small quantities at unchanged prices. Foundries seemingly are not so anxious for supplies of old material and cast scrap is easier. Although the Bethlehem embargo has been raised, that interest has again sent out notices asking that further shipments be withheld. The situation is quiet and little is heard of any probable disturbance through the enforcement of the maximum differential tariff on Canadian scrap, scheduled to become effective Feb. 1. We quote, gross tons, prices which New York dealers will pay at tidewater:

| | |
|---|---|
| Old steel rails (re-rolling) | 16.00 to 16.50 |
| Old car wheels | 15.00 to 15.50 |
| Old iron car axles | 23.00 to 24.00 |
| Old steel car axles | 20.00 to 20.50 |
| Heavy melting steel | 14.75 to 15.25 |
| No. 1 railroad wrought | 17.50 to 18.00 |
| Iron track scrap | 15.00 to 16.00 |
| Wrought pipe | 13.50 to 14.00 |
| Cast borings | 9.50 to 10.00 |
| Wrought turnings | 11.50 to 12.00 |
| Heavy cast scrap | 15.00 to 15.50 |
| Railroad malleable | 14.00 to 14.50 |
| Stove plate | 11.50 to 12.00 |
| Grate bars | 12.00 to 12.50 |

## PHILADELPHIA.

### Pig Iron Fairly Active, Following Reduction in Quotations.

Feb. 1.

**Pig Iron.**—The market continues to show a fair amount of activity and business is well distributed. Sales closed during the week included moderate blocks of foundry and puddling iron, considerable low phosphorus, some charcoal, a block of basic and a round tonnage of pipe-making iron, the last named being purchased by the three local interests from several makers and all being for early shipment. One local pipe foundry has been forced to buy heavily of spot iron because of delay in the arrival of a cargo of Middlesboro iron, due several days ago. While the statistical position of the eastern iron trade shows no material change and the melt apparently is holding up fully as well as could be expected, the undertone of the market is not so good, the liability of Washington activities again becoming a factor in the business world is more generally discussed and the shading of prices has spread, particularly to the Virginia field, where No. 2X iron is now available for early shipment on a basis of $15.50, furnace. This, with the re-adjustment in freights, means a total reduction to the consumer of 75 cents per ton, and has resulted in the sale of considerable iron, not only through this district but into New England as well. There has also been brisk selling of off grades from the Virginia district. An eastern Pennsylvania interest has also quoted low prices, according to reports as low as $17.00 per ton at the furnace for New England delivery, in order to provide back-log orders for operating an additional stack. The majority of interests are holding at $18.50 to $18.75 or $19.00 for No. 2X delivered in this district. Much has been made of the purchase of a small tonnage of prompt basic by a steel works near Philadelphia at a slight concession from the price of $18.75 prevailing on recent business, but it does not appear that any additional tonnage is available below this price. A railway equipment concern has taken 6,000 tons of low phosphorus iron for fairly early shipment at about $23.00, delivered, and

one other sale of 1,000 tons is noted, also of two 500-ton blocks of charcoal. A good movement is reported in puddle iron. The Chester furnace will probably go onto basic about Feb. 15. We quote, first half delivery at eastern Pennsylvania points, as follows:

| | |
|---|---|
| No. 1X foundry | $19.00 to 19.50 |
| No. 2X foundry | 18.50 to 19.00 |
| No. 2 plain | 18 00 to 18.50 |
| Standard gray forge | 17.00 to 17.25 |
| Basic | 18.75 |
| Low Phosphorus | 22.75 to 23.25 |
| No. 2 Birmingham | 18 50 to 19.00 |
| No. 2X Virginia | 18.50 to 19.00 |
| No. 2 plain Virginia | 18.00 to 18.50 |

**Finished Material.**—Several important structural projects are nearing the steel stage in this city and Baltimore, but this constitutes the chief activity of the eastern district. Structural and plate mills report new business as light, with the 1.60c, Pittsburg, price prevailing only on small lots, while for attractive business as low as 1.50c is being done. Plate deliveries are decidedly more prompt; on universals one eastern maker is doing two weeks with even earlier shipment on heavier gages. In the structural field, the only award of consequence was to the Jones & Laughlin Steel Co., 200 tons for the Tioga and Nicetown stations on the Reading. In this city contractors are preparing bids on the Colonial Realty Co. hotel, 1,500 tons, and the Mauran project promises early developments. At Baltimore, the Northern Central Railroad (Pennsylvania) is preparing to erect a $500,000 station, the Emerson Hotel matter is progressing favorably, a 12-story is planned for the Baltimore *News*, a Munsey property, and figures are soon to be taken on two large apartments. Strikes are delaying the completion of both the Casey Grand Hotel and the Traders' National Bank at Scranton. Rail business is still absent, though it is anticipated that the Baltimore & Ohio tonnage will be let shortly and several good inquiries from steam and trolley roads are current. No important activity in billets is noted, though a local mill has sold considerable blocks for delivery in the Pittsburg district. We quote, Philadelphia delivery, as follows: Structural shapes, 1.65c to 1.75c; plates, 1.65c to 1.75c; steel bars, 1.60c to 1.65c; bar iron, 1.70c to 1.80c; open-hearth billets, $30.60.

**Old Material.**—Embargo conditions are slightly improved, though practically no shipments are going forward to the plants on which the ban has been lifted. The development of chief interest during the week was the announcement by the Treasury Department that its ruling in regard to the classification of scrap for duty purposes had been so modified as to admit all material not suitable for use without remelting, this being the end for which dealers and consumers have contended since the new duty became effective. The result will doubtless be the importation of a good many lines heretofore barred. Rolling mill materials are in poor demand and prices are lower. We quote, eastern Pennsylvania delivery on gross tons, as follows:

| | |
|---|---|
| Old steel rails (rerolling) | $18 00 to 18.50 |
| Heavy melting steel | 17.00 to 17.50 |
| Old car wheels | 17.25 to 17.75 |
| Old iron car axles | 28.00 to 29.00 |
| Old steel car axles | 23.00 to 24.00 |
| No. 1 railroad wrought | 19.00 |
| Wrought pipe | 16.50 to 17.00 |
| Cast borings | 12 00 to 12.50 |
| Wrought turnings | 14.00 to 14.50 |
| Heavy cast scrap | 17.00 to 17.50 |
| Railroad malleable | 17.00 to 17.50 |
| Stove plate | 13.00 to 14.00 |

## BRITISH IRON MARKETS.

### Prices are Advancing and Pig Iron Stocks Decreasing.

Office of THE IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,
Birmingham, Eng., Jan. 24.

In spite of election distractions, the trade improvement goes steadily forward. The tone is strong and prices have advanced during the week in Cleveland about 4 pence, recent sales being on the basis of 52s 2d ($12.76), with 53s ½d ($12.97) for three months. In the Cleveland district there are signs in all directions of a general revival, but matters are disorganized there somewhat, through a colliery strike, which is restricting output. For several reasons, the increase of pig iron stocks has been checked. For the last year and a half they have grown at the rate of 20,000 tons a month, but up to the present the increase has been only 6,205 tons, although three weeks of the month have passed. Deliveries, so far, have been 69,268 tons, compared with 49,468 in December, and 38,775 in January of last year up to the 20th of the month. At the Midland market, Thursday, there was very little selling of pig iron, mainly because a number of makers declare themselves out of the market, although some would be prepared to do business on premium terms. Practically, all the smelters in the district are full of orders for months to come, and all prices are slightly higher. The dearness of fuel prevents any possibility of giving way in price. The hematite department is in a strong position largely on account of heavy steel demands, substantial contracts having been booked since the new year. The amount in store in Cleveland at present is 396,974 tons.

**Finished Material.**—The market, both for iron and steel, is showing much greater animation than for a long time past, and prices are steadily moving upwards. The manufacturers of steel bars, hoops and strip have now followed the example of plate and angle makers in adding 5s a ton to their quotations, so that steel bars are now £6 5s, steel strip £6 7s 6d and steel hoops £6 10s. There has been a 5s increase in joists and 7s 6d in boiler plates following the quarterly meeting. The most remarkable improvement is in half-finished steel, for which prices now range in respect of Bessemer billets from £5 5s, which represents an increase of 15s from the minimum. This is partly due to the cessation of Continental supplies due to improvement in Belgium and Germany. The position of railway material is improving, and though bookings have not been large during the last week inquiries for rails are in the market totaling about 30,000 tons for India, the Cape and the Argentine, while the Barrow district is doing much better. There is a little feeling in this district, however, owing to the diversion of orders for ship-plates to South Wales and the Clyde. It is remarkable that the price of bars has been advanced out of proportion to the amount of actual business. Some of the mills are still partially idle, and could greatly increase their output if required. The tin-plate market is reported to be thoroughly healthy and strong with well-filled order books, and further advances pending.

# METAL MARKETS.

## ST. LOUIS.

Jan. 31.

**Lead and Zinc.**—With the best basic price for 60 per cent zinc ore ranging from $47 down to $45 in the Missouri-Kansas-Oklahoma district last week, choice blende brought a top price of $49.50. The average price for all zinc blende was $45.80, as compared with $46.50 the week before. The highest price paid for calamine was $31, while the best 40 per cent grades brought $26, ranging down to $24 a ton. Calamine sold at an average price of $25.75. The top price paid for lead ore was $58 a ton, with an average price of $57.81, as compared with $57.80 the week before.

The metal market at St. Louis shaded down toward the end of the week. Spelter was nervous at $5.85, as compared with $6 at the close of the week before. Pig lead was weak at $4.55, as compared with $4.60 the

week before. The slump in the St. Louis metal market is attributed to reports from New York, which say that spelter is being scalped and that the market there is weaker.

Quite a number of operators in the Missouri-Kansas-Oklahoma district are holding their output, while others are talking of shutting down their plants. The output last week seems to have been in excess of shipments. Considerable development work was done during a spell of good weather, and the surplus of ore is growing in nearly all of the camps. Oronogo and West Joplin fields have heavy zinc surpluses. Lead ore production also is growing.

## CHICAGO.

Chicago, Feb. 1.

**New Metals.**—Quietness is the leading characteristic in this market. Business is merely nominally good, although it has been keeping up an average which compares favorably with the past. Spelter has lost additional ground, in the past week, but that is the only change to be noted in prices.

We quote as follows: Lake copper, carload lots, 14⅛c to 14¼c; castings, 13¾c, smaller lots, ¼c to ⅜c higher. Spelter, 5.95c to 6.00c; lead, desilverized, 4.70c to 4.75c, in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8 list f. o. b. La Salle in car lots of 600-pound casks; pig tin, 33½c to 33¾c; Cookson's antimony, 10½c; other grades, 9¾c to 10¼c.

**Old Metals.**—Dealers report a routine demand, which is steady, but in the main, business has been quiet throughout the past week. In sympathy with the new metal, scrap zinc is fractionally lower.

We quote dealers' selling prices, as follows: Copper wire, 13½c; heavy copper, 13½c; light copper, 11½c; heavy red brass, 13c; heavy yellow brass, 10¼c; light brass, 7½c; No. 1 red brass borings, 10½c; No. 1 yellow brass borings, 8c; brass clippings, 9½c; tea lead, 3.80c; lead scrap, 4½c; zinc, 4¼c; tin pipe, 31c; tin foil, 29c; pewter, 24c; electrotype plates, free from wood, 4½c; electrotype dross, 3¼c; stereotpye plates, 5c; stereotype dross, 3½c; prime slab zinc dross, $78 per ton.

## NEW YORK.

Feb. 1.

**Copper.**—The dullness of last week has been intensified and practically no metal has been sold. The price is largely a matter of conjecture, in the absence of business. An offer to sell electrolytic on Saturday at 13.62½c was declined. Lake can be had at 13.87½c. Melters have much copper contracted for at lower prices than now prevailing and therefore are not looking forward to making any purchases. The total exports during January were 26,598 tons, compared with 19,190 tons in the same month last year. The imports during 1909 amounted to 145,000 tons and in 1908 97,700 tons.

**Pig Tin.**—The statistics were highly unfavorable. The world's visible supply on Jan. 31 was 23,024 tons. This is the largest amount of tin in sight since September, 1898. At that time the price of tin in New York was about half of what it is today. The statistics for the United States also indicate lower prices. It is true that the deliveries were larger than was expected, but the arrivals were unusual and the stocks increased nearly 1,500 tons. In spite of the large stocks of tin here, spot is very scarce. The leading consumer has practically all of it. The prices this afternoon are, the highest since the last report, 32.65c.

**Lead.**—The market was a little softer the latter part of last week, but since then prices have recovered. The leading interest is quoting the unchanged price of 4.70c, New York, and outside sellers are asking 4.72½c.

**Spelter.**—Prices are no higher than last week. Prime western can be had at 6.12½c.

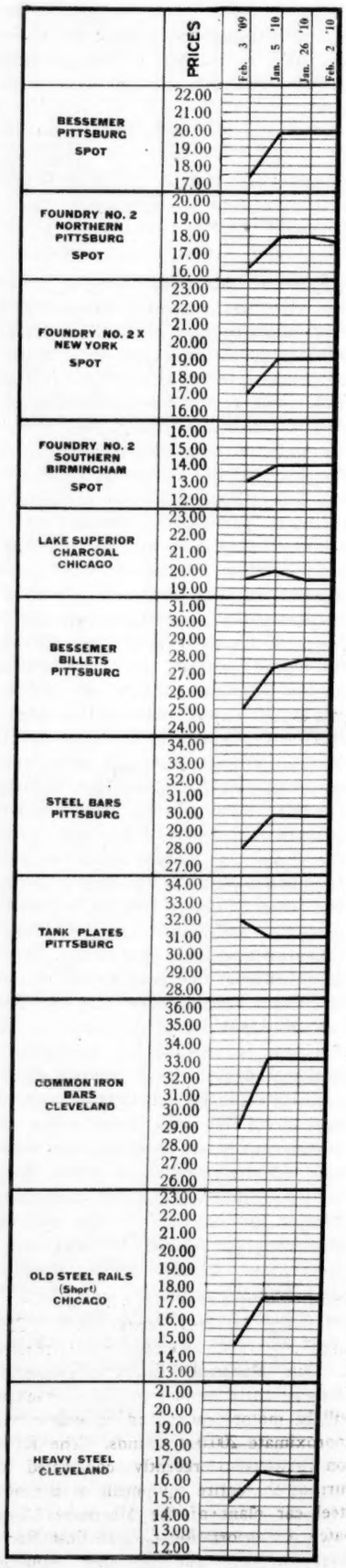
**Antimony.**—The market is without change from the last report. Hallett's can be had at 8.37½c, and Cookson's 8.50c.

## WILL GO WEST

Carl E. Maeder, superintendent of rolling mills at Duquesne, of the Carnegie Steel Co., has resigned to become general manager of the Western Steel Corporation, which is building a steel plant at Irondale, Wash., about 20 miles north of Seattle. The new steel company expects to be making steel sometime in May and this will be the first steel ever made west of Colorado. Mr. Maeder will leave Pittsburg March 1 for the Pacific coast. N. V. F. Wilson, formerly general manager of the Colonial Steel Co., Monaca, Pa., has been appointed assistant general manager of the Western Steel Corporation, and has left Pittsburg for Irondale to enter upon his new duties.

The Republic Iron & Steel Co. lighted Hazelton No. 1 stack Jan. 30, and blew out Pioneer No. 1 furnace Jan 20.

## PRICE CHART.



## HALF YEAR EARNINGS AND SURPLUS OF REPUBLIC IRON & STEEL CO.

The Republic Iron & Steel Co. increased its net earnings $669,752 in the six months ending Dec. 31 last, according to the half yearly statement just made public. The total net earnings for the six months period aggregated $1,901,400. Back dividends were paid to the amount of $1,378,141, which decreased the surplus by $399,867. The statement in further detail follows:

| | | Increase. |
|---|---|---|
| Net earnings | $1,901,400 | $ 669 752 |
| Other income | 72,211 | 44,904 |
| Total income | $1,973,611 | $ 714,656 |
| Depreciation | 439,862 | 171,875 |
| Net profits | $1,533,749 | $ 542,781 |
| Interest | 199,357 | *9,281 |
| Balance for dividends | $1,334,392 | $ 552,062 |
| Dividends | 794,796 | 794,796 |
| Surplus | $ 539,596 | $ *242,734 |
| Previous surplus | 5,920,535 | 1,221,008 |
| Total surplus | $6,460,131 | $ 978,274 |
| Back dividends paid | 1,378,141 | 1,378,141 |
| Final surplus | $5,081,990 | $ *399,867 |

*Decrease.

In his remarks on the figures above shown, Chairman John A. Topping said in part:

The general improvement in business anticipated in the annual report has been fully up to expectations, and the net earnings for the period of this report shows substantial improvement as compared with the six months period for the year ending Dec. 31, 1908, but as compared with a smilar six months' period of 1907, less profits were made.

On Dec. 31 last the company had on hand unfilled orders for pig iron amounting to 39,995 tons in comparison with 94,247 tons on June 30, 1909, and 89,934 tons on Dec. 31, 1908.

The reduction in costs has been more than offset by greater reduction in selling prices and profits are necessarily less than for the six months ending Dec. 31, 1907.

## MACHINE TOOL ORDERS PLACED AT CHICAGO.

Chicago, Feb. 1.

The outlook for heavy machinery is very good, as is evidenced by a contract which Jos. T. Ryerson & Sons recently closed with the Pressed Steel Car Co., of Pittsburg, covering a number of very heavy multiple punches for the Allegheny and McKees Rocks plants. This machinery is to be specially constructed for multiple punching of steel underframes for steel cars. Each machine will be motor-driven, and in weight will approximate 200,000 pounds. The Ryerson firm also recently contracted to furnish the entire equipment of the new steel car plant of the Merchants' Despatch Transportation Co., at East Rochester, N. Y. The equipment consists of hydraulic machinery, punches, shears, pneumatic riveting machinery, metal saws, pumps, rotary shears, etc. The Henry E. Pridmore molding machine works recently received an order for a number of machines for each of the Milwaukee, Champion, and McCormick divisions of the International Harvester Co., among which are several machines for molding fly-wheels over 5 feet in diameter, for gasoline engines. The Pridmore works also received six orders for heavy, double-shaft, stripping-plate machines for the Worthington shop of the International Steam Pump Co., at Harrison, N. J. Other orders are being received by this firm, which assure a steady operation of the plant for some time to come.

The Great Northern railway will build a shop at Seattle or Spokane which will be one of the largest, if not the largest, on the system. Including machinery for this plant, the company is in the market for a large number of machines, a list of which appears elsewhere in this issue.

## NEW STRUCTURAL CONCERN AT SOUTH BETHLEHEM.

Cincinnati, Feb. 1.

A new concern to be known as the Vanderstucken-Ewing Construction Co., maker and assembler of structural steel work, will be located at South Bethlehem, Pa., along Monocacy creek. Charles P. Taft and several other wealthy men of this city have subscribed for a portion of the preferred stock of the company and will be indirectly interested in the concern. Frank Vanderstucken Jr. is a son of Frank Vanderstucken, of this city, leader of the Symphony orchestra.

## PITTSBURG ENGINEERS.

The annual banquet of the Engineers' Society of Western Pennsylvania was held at the Fort Pitt Hotel Saturday evening, Jan. 29, with nearly 250 members and guests in attendance. Aside from the merry-making which always marks these annual events the notable features of the banquet were addresses by Dr. Joseph A. Holmes, of the United States Geological Survey; Dr. Geo. C. Johnson, of Pittsburg; Dr. Maitland Alexander, of Pittsburg, and Prof. Frederic L. Bishop, of the University of Pittsburg. President Edwin K. Morse, of the society, introduced the toastmaster, Geo. H. Neilson.

The Hampden Brass Co., Springfield, Mass., has awarded the contract for a proposed foundry on Liberty street, one story, 36 x 132 feet.

## DETERMINING COST

### And Ohio Iron & Steel Co.'s Plans Are Deferred for a Short Time.

Directors of the Ohio Iron & Steel Co., which recently increased its capital stock to $5,000,000, have determined to proceed a little farther into the probable cost of equipment, delivery, etc., before adopting finally plans for an open-hearth steel plant proposed to be built near the company's Mary blast furnace, at Lowellville, O. Plans tentatively drawn by Julian Kennedy, of Pittsburg, call for six 60-ton open-hearth furnaces, with provision for six additional furnaces, four soaking pits, a 38-inch blooming mill, a continuous mill for rolling sheet bars and billets, as well as a gas-producing plant. It is believed that with the use of about 300 tons of scrap, the present blast furnace capacity will be large enough to supply the immediate needs, which will be 750 tons.

Formal ratification of the plans has been postponed for several weeks until further information can be secured as to cost as well as deliveries of equipment, and also until some changes in the plans can be made.

## RECEIVERS NAMED FOR HURON STEEL & IRON CO., OF NORWALK, O.

E. G. Martin, of Norwalk, O., and the Cleveland Trust Co., of Cleveland, were appointed receivers for the Huron Steel & Iron Co., of Norwalk, O., Jan. 27 by Federal Judge Tayler, on application of a judgment creditor, the Norwalk National Bank. The company has $1,250,000 in bonds outstanding, $1,250,000 in capital stock, additional liabilities aggregating $100,000 and assets estimated at $500,000. Early in February, the Huron company took over the plants in Norwalk, O., of the Norwalk Steel & Iron Co., and the William Kavanaugh Co., which it purchased at a bankrupt sale. The reason assigned for the company's difficulties is that when the reorganization a year ago took place, sufficient working capital was not provided to carry on the business.

Princess furnace, at Glen Wilton, Va., will be blown in Feb. 7. The furnace has been rebuilt and enlarged, another stove added and a new blowing engine installed.

West End Furnace Co., Roanoke, Va., banked its stack Jan. 21 for general repairs, expecting it to be out about three weeks.

# OUR FOREIGN COMMERCE

**Iron and Steel Exports Show Great Gain in December, Making Best Month but One on Record—Unchanged Distribution of Exports—Tonnage Movement by Years—Export Values for Twelve Years—Ore Imports Make New Record**

Iron and steel exports in 1909 have proved to be larger than indicated in our editorial forecast published Jan. 6, since the forecast was based upon an estimate that December exports would prove equal to the November figure, whereas December showed a gain of nearly 22,000 tons over November, making the year's total 1,243,462 tons.

The December exports were by far the largest for any month in the year, amounting to 137,688 gross tons. Indeed, with the single exception of March, 1906, they were the largest exports for a month on record, and they fall short of the March, 1906, total, by less than 2,000 tons.

Since the two months March, 1906, and December, 1909, show substantially the same totals, a comparison by items may not be uninteresting. The most striking feature shown by the comparison is the similarity in the figures by items. There has been really very little change in the distribution, as to character of material, in over three years and a half. The greatest change is that billets show a great decrease and rails a great increase, the one dropping from 28,421 tons to 3,625 tons, while the other increased from 35,431 tons to 53,151 tons. Adding the two together, however, we find 64,000 tons in March, 1906, and 57,000 tons in December, 1909. The two commodities are not greatly different in method of manufacture and degree of finish, so that the net result is a small change. There are only minor variations in the other items. Pipes and fittings show the most striking similarity in the two months, changing only from 16,770 tons to 16,765 tons, a difference of only five tons. It becomes quite evident from the agreement that our iron and steel export trade is no haphazard affair, but is remarkably well settled, varying chiefly as the general activity in foreign markets varies.

### Tonnage Movement by Years.

Below are given the total imports and exports by calendar years of the tonnage lines, the figures representing gross tons:

| | Imports. | Exports. |
|---|---|---|
| 1902 | 1,212 839 | 372,398 |
| 1903 | 1,178 996 | 326 590 |
| 1904 | 266 398 | 1,167 710 |
| 1905 | 416,000 | 1,010,255 |
| 1906 | 577 809 | 1,325,740 |
| 1907 | 662.358 | 1,301,979 |
| 1908 | 205.845 | 964,242 |
| 1909 | 362,501 | 1,243,462 |

Exports by months in the past three calendar years are shown below, it being noted that the December exports easily pass those of any other month in the period. Indeed, such exports continued steadily for a year would roll up a total of about 1,650,000 tons, or more than 300,000 tons in excess of the best year on record. While the rate may not be fully maintained, there is every reason to believe that 1910 will easily make a new record in exports for a calendar year, probably exceeding 1,500,000 tons, while indeed it is far from impossible that the average monthly rate may exceed even the large total for December just past. There is no item in the December figures which may not readily be duplicated each month. There is room, indeed, for the seaboard plants, depending upon imported ore, to do still better, in such items as unfinished steel, rails and structural shapes.

TOTAL IRON AND STEEL EXPORTS. GROSS TONS.

| | 1907. | 1908. | 1909. |
|---|---|---|---|
| January | 102,630 | 74,353 | 70,089 |
| February | 64,728 | 81 773 | 84,860 |
| March | 112,787 | 96 681 | 94,522 |
| April | 132,792 | 93 285 | 100 903 |
| May | 91,543 | 64,020 | 109,977 |
| June | 92,996 | 69 779 | 114 721 |
| July | 122,249 | 86 806 | 100,670 |
| August | 118,792 | 86,244 | 105 694 |
| September | 114,819 | 76,727 | 97,387 |
| October | 123,170 | 85,668 | 110.821 |
| November | 116,308 | 71 028 | 115 943 |
| December | 86,019 | 77,659 | 137,683 |
| Total | 1,301,979 | 964,242 | 1,243,462 |

### Tonnage and Non-Tonnage Values.

The tonnage exports which have just been considered comprise all the lines of which the weight is returned, scrap, pig iron, unfinished steel, finished rolled products, wire, pipes and fittings, etc. The value of these tonnage lines is generally about two-fifths the value of all iron and steel exports, the remaining lines comprising hardware, tools and cutlery, machinery of all descriptions (except agricultural implements), castings, etc. In the following table is given the respective values of the tonnage and non-tonnage exports, with the totals:

IRON AND STEEL EXPORTS.

| | Tonnage. | Non-tonnage. | Total. |
|---|---|---|---|
| 1898 | $18,095,244 | $ 64,676,306 | $ 82 771,550 |
| 1899 | 25,162,220 | 80,526,857 | 105,689,077 |
| 1900 | 42.518,072 | 87,115 408 | 129.633,480 |
| 1901 | 29.050,446 | 73 484,129 | 102,534 575 |
| 1902 | 20,996,450 | 76,895,586 | 97,892,036 |
| 1903 | 20,452,839 | 78,583.026 | 99,035,865 |
| 1904 | 42,551,109 | 86,002.504 | 128 553,613 |
| 1905 | 42.104,348 | 100,824,165 | 142,928,513 |
| 1906 | 52,215,089 | 120,340,499 | 172,555,588 |
| 1907 | 60,046,221 | 137 020,560 | 197,066.781 |
| 1908 | 43,397,323 | 107,715,791 | 151,113,114 |
| 1909 | 50,783,138 | 106,987,193 | 157,680,331 |

Exports of agricultural implements, not included in the above, increased from $9,973,384, with no recessions except slight ones in 1904 and 1908, to $27,327,428 in 1909. The importance of the agricultural implement export trade is perhaps not generally recognized. It has increased with remarkable steadiness, whereas our exports of the tonnage lines have not reached important proportions until recently. In 1903 the exports of agricultural implements actually exceeded in value the exports of all tonnage lines, amounting to $22,951,805 against $20,452,839 for the tonnage lines, which totaled 326,590 tons. In 1908 and 1909 agricultural implement exports exceeded one-half the value of the tonnage lines exported.

IRON AND STEEL EXPORTS, GROSS TONS.

| | December. | | Twelve months, ending December, | |
|---|---|---|---|---|
| | 1908. | 1909. | 1908. | 1909. |
| Scrap | 843 | 403 | 21,834 | 25,360 |
| Pig iron | 4,732 | 4,076 | 46,696 | 61,999 |
| Billetts, sheet bars, etc. | 7,893 | 3 625 | 112,177 | 104,862 |
| Wire rods | 912 | 2,362 | 7,412 | 20,142 |
| Rails | 10,243 | 53,151 | 196,510 | 299 540 |
| Structural iron and steel | 9,938 | 8.515 | 116,881 | 90 830 |
| Bar iron | 548 | 1,249 | 8,224 | 13,536 |
| Steel bars | 4,592 | 7,322 | 43,881 | 74,423 |
| Sheets and plates | 11,428 | 21,014 | 104 993 | 180,048 |
| Tin plates | 285 | 1,130 | 11,878 | 9,327 |
| Hoop, band and scroll | 455 | 600 | 4,339 | 3,856 |
| Wire | 11,953 | 12,983 | 136,145 | 149,341 |
| Wire nails and spikes | 3,331 | 3,075 | 26,510 | 30,656 |
| Cut nails and spikes | 735 | 705 | 7,023 | 9,936 |
| All other, including tacks | 706 | 713 | 5,377 | 7,464 |
| Pipes and fittings | 9,065 | 16,765 | 114,362 | 162,140 |
| Totals | 77,659 | 137,688 | 964,242 | 1 243,462 |

IRON AND STEEL IMPORTS, GROSS TONS.

| | December. | | Twelve months, ending December, | |
|---|---|---|---|---|
| | 1908. | 1909. | 1908. | 1909. |
| Scrap | 1,061 | 22,080 | 5,090 | 163,504 |
| Pig iron | 10,330 | 28,607 | 92,202 | 174,988 |
| Billets bars and steel n. e. s. | 2,204 | 4,887 | 11,212 | 19,287 |
| Wire rods | 652 | 591 | 11 209 | 10,544 |
| Rails | 48 | 728 | 1.719 | 1,513 |
| Structural | 670 | 520 | 3,623 | 6,146 |
| Bar iron | 1,106 | 2,683 | 19,671 | 19,206 |
| Sheets and plates | 393 | 765 | 2,629 | 4,720 |
| Tin plates | 2,475 | 5,195 | 58.490 | 62,593 |
| Totals | 18,939 | 66,056 | 205,845 | 362,501 |

### Pig and Ore Imports.

Iron ore imports in 1909 easily broke all records, and a somewhat surprising feature of the year's movement was that the movement in December was the largest for any month of the year, the next highest being August.

The importations in the current year promise to exceed the 1909 total.

IMPORTS IN 1909, GROSS TONS.

| | Pig iron | Iron ore. |
|---|---|---|
| January | 11,048 | 105,233 |
| February | 9,595 | 61 749 |
| March | 10,771 | 108,676 |
| April | 8,117 | 74,782 |
| May | 8,747 | 97,393 |
| June | 10,623 | 124,714 |
| July | 17,899 | 172,316 |
| August | 10,422 | 209,855 |
| September | 12,601 | 164,613 |
| October | 11,851 | 179,505 |
| November | 34,707 | 174 976 |
| December | 28,607 | 222,609 |
| Total | 174,988 | 1,696,411 |

As has been frequently pointed out in these reviews, the government returns of "pig iron," given above, include ferrosilicon, ferromanganese, spiegeleisen, etc., commodities which are imported at all times, but in larger quantities when the iron and steel trade is active. There is, besides, some ordinary pig iron imported on the Pacific coast, China having recently become a party to this trade. Imports of ordinary pig iron on the Atlantic coast have only lately appeared, and then only in quite modest quantities. In the first half of 1909 the imports of pig iron, exclusive of ferromanganese, spiegeleisen, ferrosilicon, ferrochrome and tungsten, amounted to only about 12,000 tons, or at the rate of 2,000 tons a month. In the third quarter they amounted to about 4,000 tons per month. In that quarter, according to the official quarterly returns, the imports of the special alloy metals averaged about 10,000 tons monthly. Assuming that the same rate held good in the fourth quarter, the imports of ordinary pig iron were negligible in October, and ranged only from about 25,000 tons in November to 18,000 tons in December. The trend, too, is downward, so that there is no prospect of any noteworthy import movement in pig iron.

## WILL DEAL IN SECOND-HAND MACHINERY.

The receivers of the Buffalo Tool & Machine Co., of 176 Terrace, have sold the entire stock to a syndicate of Buffalo men. The stock consists of $50,000 worth of iron and woodworking machinery and pulleys. The purchasers were: M. Alexander, J. J. Sweeney, Harry Harriton, Max Benstock, Samuel Rosenberg, A. G. Irr, Martin J. Cook, Main Salvage Co., Erie Merchandise Co. and Benstock & Rosenberg, all of Buffalo. The new owners have taken possession and will be active in the second hand machinery field.

The Russellville Iron Co., Russellville, Ala., has increased its capital stock from $100,000 to $120,000.

## HIGHER WAGES

### Demanded by Union of Lake Employes—No Trouble Expected.

Operators, shippers and vessel owners have practically reached an agreement upon all points in the lake trade for 1910, though the coal rate still remains to be settled. It is expected, however, in conformity with the general advance all along the line, that the rate to Lake Michigan will be restored to 35 cents. Many of the leading men of the trade have left for their vacations and will be gone till about March 1.

No trouble is expected anywhere. The Marine Engineers' Beneficial Association in annual session at Washington this week adopted a schedule of wages which calls for a general advance. For instance, their schedule puts the wages of chief engineers on first-class steamers at $190 a month as against $175 paid last year. At the annual meeting of the Lake Carriers' Association last month, the wages on second-class steamers were advanced from $5 to $15, in order to eliminate certain discrepancies in the scale. No change was made, however, in the pay of engineers on first-class steamers. The Marine Engineers' Beneficial Association has also forbidden its members to sign individual contracts of any kind, but a number of the leading fleets have already signed contracts with their engineers for 1910. It is not expected that these engineers will break these contracts or insist upon the scale as fixed by the Marine Engineers' Association. In point of fact, the national organization is too cumbersome a body to deal with the peculiar and specific conditions on the lakes. The great majority of its members are not directly interested and have only a remote understanding of the subject. The lake engineers, who are the only ones involved, would undoubtedly prefer to be permitted to settle their own affairs.

Ice conditions are reported heavier than for several years past. The ice in Duluth harbor is 24 inches thick and extends into the lake for many miles.

## WARWICK IRON & STEEL CO. MAKES ANNUAL REPORT.

The report of the Warwick Iron & Steel Co., Philadelphia, operating three blast furnaces at Pottstown, Pa., for the year ending Dec. 31 last, shows earnings of $214,956, after the payment of interest, etc., compared with $148,632 in 1908. In his report, President T. S. Cook called attention to the fact that "the improvement commencing with May in the way of larger sales, although at the lowest prices of the year, developed into a largely increased demand with advancing prices, so that it was found desirable to put No. 3 furnace into operation the middle of September. No. 1 and No. 2 furnaces were in blast throughout the year. Our total production of pig iron for 1909 was 281,137 tons, the largest yearly production in the history of the company. The shipments of the year amounted to 281,065 tons." Various improvements at the furnaces were made, including rebuilding hot blast stoves at No. 1 furnace, and the addition of a large Allis-Chalmers blowing engine. The company has secured a controlling interest in a limestone quarry in the Lebanon valley. Dividends were paid during the year aggregating $88,898. The statement of assets and liabilities as of December 31 compares as follows:

| Assets: | 1909. | 1908. |
|---|---|---|
| Real est., plant & equip. | $2,116,318 | $2,028,263 |
| Bills and accts. rec. | 636,321 | 529,386 |
| Cash | 113,206 | 169,188 |
| Mat. on hand, ore, coke, coal, etc. | 541,811 | 610,633 |
| Total | $3,407,657 | $3,391,470 |
| Liabilities: | | |
| Capital | $1,486,715 | $1,486,715 |
| Mortgage bonds | 195,000 | 210,000 |
| Profit and loss | 863,443 | 803,353 |
| Net earnings for year | 214,956 | 148,632 |
| Reserve for relining furnaces | 121,139 | 100.091 |
| Bills and accts. payable. | 526,402 | 642,679 |
| Total | $3,407,657 | $3,391,470 |

## ADDITION TO HUMBERT PLANT.

Plans have been prepared by the American Sheet & Tin Plate Co. for the erection of a new building, 162 feet long, at the Humbert plant at South Connellsville, Pa. It will be an extension to the main hot mill building to protect the semi-finished material from the weather. It will not mean any additional employment of men, but will give protection to the forces handling the raw material who have heretofore worked in the open. A new 12-ton crane has been installed at the plant, giving it two cranes. A new annealing furnace has also been installed.

## CONTRACT FOR ENGINE.

The Wm. Tod Co., Youngstown, has received a contract to build a twin tandem compound engine of 44 and 76 x 60 inches for the Republic Iron & Steel Co.'s new 40-inch blooming mill at Lansingville, O. This will be an exact duplicate of the engine at the Ohio works of the Carnegie Steel Co., located at Youngstown.

La Follette furnace, of the La Follette Coal, Iron & Railway Co., at La Follette, Tenn., will be put in blast about Feb. 7.

## STEEL PLANT

### Of Diamond State Company May be Sold and Placed in Operation.

It can be stated authoritatively that negotiations are now under way, with every promise of success, whereby the plant of the Diamond State Steel Works, Wilmington, Del., will be acquired by interests which will proceed at once to place it in shape for operation. The property has been idle for several years, being held by a syndicate with headquarters in Philadelphia. Several attempts have been made at various times to acquire the works and operate them, but in the present instance it is learned that negotiations have practically been consummated. The steel plant includes five 50-gross-ton open-hearth furnaces, four basic and one acid, with an annual ingot capacity of 150,000 tons, in connection with which there is a 34-inch blooming mill. This part of the works is about ten years old. There is also equipment for the production of about 60,000 tons of various finished products. It is stated that the property has been well cared for and is in good shape. The plant enjoys tidewater shipping facilities and is otherwise well located.

## EMPLOYERS' ASSOCIATION OF BUFFALO IS ACTIVE.

Buffalo, Feb. 2. (By wire.)

The Employers' Association of Buffalo held its annual meeting yesterday, electing the following directors: Harry G. Breed Jr., William H. Crosby, C. D. Taylor, Henry R. Ford, David C. Howard, Lyman P. Hubbell, Edward Kener Jr., C. W. Sherman, R. W. Gardner, C. M. Treiner, T. L. Richmond, Geo. M. Trefts, I. M. Edsall, Henry May and A. J. Russell. The directors will meet to elect officers. R. W. Gardner served the past year as president; I. M. Edsall as vice president; A. J. Russell, second vice president; Geo. M. Trefts, treasurer; and John E. Gorss, secretary. The association reports much progress. Membership increased by adding many leading interests of western New York. A banquet is planned.

**New Bond Issue.**—At the special meeting of the stockholders of the Allegheny Steel Co., of Pittsburg, on Tuesday, Jan. 25, it was decided to make a new bond issue of $150,000 to cover expenditures in connection with the recent additions to its Reliance tube plant and the cold rolling department at the Brackenridge, Pa., plant. The cold rolling department is now in operation, and it is expected that the new additions to the tube plant will be completed in the very near future.

## NO NEW BURDEN FURNACE.

The Burden Iron Co., Troy, N. Y., states that there has been no thought of erecting a new blast furnace at that place, as has been reported in the iron trade. Investigation is being made regarding the remodeling of the present blast furnace, which has been idle for some time, but no decision has as yet been reached.

## PERSONAL.

C. H. Zehnder, who sailed Feb. 2 for a brief foreign trip, was tendered a dinner Jan. 25 by his associates in the Empire Steel & Iron Co. and others, following a meeting of the directors of that company.

Charles M. Schwab was the guest of honor at the second annual dinner of the Bethlehem Industrial Commission, held Jan. 26, at the Sun Inn Casino, with about 200 of the business men of Bethlehem in attendance, and spoke of his plans for increasing the steel works at South Bethlehem.

Alexander Johnson has been appointed chief engineer of the New York City department of bridges. He is a graduate of the Sheffield Scientific School and for several years has been identified with the building of the East river bridges, recently as consulting engineer in the department.

John Stevens Jr. has been elected president and general manager of the Mann Edge Tool Co., with plants at Lewistown and Mill Hall, Pa., succeeding Joseph R. Mann, who retires. William Mann has been made manager of the Mill Hall plant, succeeding Albert Mann. Small edge tools are manufactured.

A. D. McAdam, formerly vice president of the Damascus Brake Beam Co., Cleveland, has resigned and has been chosen vice president of the St. Louis Surfacer & Paint Co., St. Louis, with offices at 1101 Fisher building, Chicago. For several years, Mr. McAdam was connected with the American Car & Foundry Co., and the Michigan Malleable Iron Co., Detroit.

David Whitcomb, of New York, has been elected secretary of the Western Steel Corporation, Seattle, Wash., to succeed M. M. Lyter, who hereafter will devote all of his time to his work as general counsel of the company. Mr. Whitcomb is the son of G. Henry Whitcomb, a wealthy capitalist of Worcester, Mass. While a lawyer by profession, David Whitcomb holds a degree of mechanical engineer from the Worcester Polytechnic Institute.

S. Norton, general manager of Witherbee, Sherman & Co., Inc., at Mineville, N. Y., and one of the best known mining engineers in the country, will speak before the Society of Engineers of Eastern New York, at Troy, N. Y., on the evening of Feb. 9, taking as his subject "The Iron Ores of New York State." The meeting will be held in the lecture room of the engineering department at the Rensslaer Polytechnic Institute, and the address will be illustrated with a number of lantern slides, chiefly showing underground workings in the Mineville district.

## OBITUARY.

George Frederick Vietor, president of the New Jersey Iron Mining Co., died at New York, Jan. 29, aged 71 years.

David W. Binns, a retired iron manufacturer, died at Brooklyn, Jan. 29. For many years he conducted an iron foundry in Brooklyn.

Nathaniel M. Simonds, who had been identified with stove manufacturing in Chicago for 57 years, died Jan. 26, at Wheaton, Ill., aged 81 years.

Thomas C. Craig, president of the Pennsylvania Forge Co., died Jan. 25 at his home in Germantown, after a short illness from pneumonia. He was a native of Philadelphia and had been at the head of this company for a number of years.

George Brill, a member of the J. G. Brill Car Mfg. Co., Philadelphia, died at his home in that city Jan. 30 after a long illness. He was born in 1848 and was the second son of the founder of these works.

Alexander Faulkner, formerly treasurer of the International Molders' Union, died Jan. 25 at his home in Cleveland, aged 72. At the Toronto convention of the molders' union in 1902 he was elected treasurer and was re-elected in 1907, resigning last August on account of ill health.

Charles B. Parsons, one of the pioneers of the southeast Missouri lead belt, resident director of the St. Joe Lead Co., and officer and director in several of the largest corporations in southeast Missouri, died at his country home at Riverside, Mo., Jan. 28. Mr. Parsons was born in Benson, Rutland county, Vt., Feb. 26, 1836. He served in the union army during the civil war and engaged in mining in Massachusetts for a short time after the war closed. He went to Missouri in 1867, as superintendent of the St. Joe Lead Co., at Bonne Terre.

# Market Unsteady and Prices Lower

The opening days of the stock market the last week witnessed many violent fluctuations in prices of stocks and great activity, particularly in United States Steel, of which more than a million shares were handled during the first three days. Copper stocks were uniformly lower on account of the announcement of the proposed increase in the capital of the Anaconda company from $30,000,000 to $150,000,000 for the purpose of carrying out the copper merger.

Monday, Steel common broke to 84⅛, and the whole market was unsettled and weak. The foreign market was considerably affected by the floods in France. Call money was easy at from 3½ to 4 per cent. Tuesday, stocks broke again, reaching the lowest level in several months. Sales of United States Steel amounted to 433,000 shares, and the price touched 81⅛. President Taft issued a statement denying rumors of the proposed trust prosecutions. United States Steel announced the usual dividends and an extra dividend of ¾ of 1 per cent on common. Wednesday, there was a general recovery of prices, and a smaller volume of business. The Pennsylvania railroad announced a stock dividend of $16.66, and the Pan Handle authorized a stock allotment of 12½ at par. Thursday, the market was weak again, and call and time rates were lower. Friday, the market was quiet and firmer. Call loans were 2½ to 3 per cent. Saturday, the market was firm and more active under the leadership of Union Pacific and Reading. Pittsburg coal gained 4½ points reaching 75.

Money on call was easy throughout the week and closed Saturday at 3 per cent.

Bank clearings for the United States for the week were estimated at $3,780,526,158 against $4,241,362,802 the week before, and $2,931,469,866 the corresponding week last year. The actual report of clearing house banks showed loans increased $10,650,000; deposits increased, $17,713,200; surplus increased $1,814,800, and the ratio of reserve 27.6 against 27.5 the week before. Trust companies and nonmember banks showed loans and investments decreased $3,217,100, and the percentage of reserve 17.1, against 17 for the week before.

Exports of gold from New York were reported at $270,200, and imports at $94,633.

Failures for the week numbered 316 against 295 for the week before, and 326 the corresponding week last year. Liabilities in failures for the month of January up to Jan. 29, amounted to $28,661,204, against $11,779,977 for the corresponding period last year. The report of the American Railway Association showed 26,844 idle freight cars on Jan. 19, representing a decrease of 11,572 from two weeks before that date.

The number of shares dealt in on the New York exchange was 5,882,700, against 5,367,714 the week before, and 3,206,964 the corresponding week of last year. Bonds, other than government bonds, were sold to the value of $18,096,000 during the week, against $20,301,000 for the week before, and $32,525,000 for the corresponding week in 1909.

## THE LEADING INDUSTRIAL SECURITIES.

| | Closing Quo. Jan. 29 | Changes in week | Date 1910 Ann. M't'g. | Stock Outstanding | Basis | Dividend Last Dividend | Dividend Date Last Div. Pay. |
|---|---|---|---|---|---|---|---|
| Allis-Chalmers | 13½ | + ¼ | | $19,820,000 | | ..... | ..... |
| Allis-Chalmers, pr | 46 | —2 | | 16,150,000 | 7 cum. | 1¾ Q. | Feb., 1904 |
| American Can | 11⅛ | —1⅜ | Feb. 2 | 41,233,300 | | ..... | ..... |
| American Can, pr | 76 | —3⅜ | | 41 233,300 | 7 cum. | 1¼ Q. | Jan., 1910 |
| Am. Car & Fdy | 65 | —1½ | June 24 | 30,000,000 | | ½ Q. | Jan., 1910 |
| Am. Car & Fdy., pr | 118 | + ½ | | 30,000,000 | 7 n. c. | 1¾ Q. | Jan., 1910 |
| American Loc | 52¾ | —1¾ | Oct. 18 | 25,000,000 | 5 | 1¼ Q. | Aug., 1908 |
| American Loc., pr | 112½ | — ½ | | 25,000,000 | 7 cum. | 1¾ Q. | Jan., 1910 |
| Am. Ship | 77⅛ | ..... | Oct. 12 | 7,600,000 | 4 | 1 Q. | Dec., 1909 |
| American Ship, pr | 112 | ..... | | 7,900,000 | 7 cum. | 1¾ Q. | Jan., 1910 |
| Am. Steel Foundries(new) | 60½ | —3½ | Dec. 1 | 17,184,000 | | 1¾ Q. | ..... |
| Barney & Smith | 40 | ..... | June 7 | 2,000,000 | 4 | ..... | Sept., 1907 |
| Barney & Smith, pr | 100 | ..... | | 2 500,000 | 8 cum. | 1 Q. | June, 1908 |
| Bethlehem Steel | 30 | —2 | April 5 | 14,862,000 | | ..... | ..... |
| Bethlehem Steel, pr | 64 | —1 | | 14,908,000 | 7 n. c. | ¾ Q. | Feb., 1907 |
| Cambria Steel | 50 | — ¾ | Mar. 15 | 45,000,000 | 5 | 2½ S. A. | Feb., 1910 |
| Cambria Iron | 46¾ | + ¾ | | 8,468,000* | 4 | 2 S. A. | Sept., 1909 |
| Chicago Pneumatic Tool | 41½ | ..... | Feb. 21 | 6,145,000 | 4 | 2 S. A. | Oct., 1907 |
| Colorado Fuel | 39¾ | —5¾ | Oct. 17 | 34,235,500 | | 1¾ Q. | April, 1902 |
| Crucible Steel | 16⅜ | — ¼ | Oct. 19 | 24,578,400 | | 3½ | ..... |
| Crucible Steel, pr | 89 | —1½ | | 24,436,000 | 7 cum. | 1¾ Q. | Dec., 1909 |
| Empire Steel | 15 | ..... | Feb. 23 | 1 254,770 | | ..... | ..... |
| Empire Steel, pr | 85 | ..... | | 2,500,000 | 6 cum. | 3 S. A. | July, 1909 |
| Fay & Egan | 95 | ..... | Feb. 15 | 1,000,000 | 7 | 3 S. A. | Nov., 1908 |
| Fay & Egan, pr | 120 | ..... | | 1,000,000 | 7 cum. | 1¾ Q. | Nov., 1909 |
| General Electric | 153 | —2½ | May 10 | 65,179,600 | 8 | 2 Q. | Jan., 1910 |
| Harbison-Walker | 34 | ..... | Jan. 17 | 18,000,000 | | 2 Q. | Oct., 1907 |
| Harbison-Walker, pr | 93½ | — ½ | | 9,600,000 | 6 cum. | 1½ | Oct., 1909 |
| International Pump | 49½ | —1 | May 10 | 17,762,500 | | 1 Q. | April, 1905 |
| International Pump, pr | 86 | —1 | | 11,350,000 | 6 cum. | 1½ Q. | Feb., 1910 |
| Lackawanna Steel | 49½ | —14½ | Mar. 9 | 34 978,000 | | ..... | ..... |
| Lake Sup. Corp | 23 | —1¾ | Oct. 5 | 40,000,000 | | ..... | ..... |
| New York Air Brake | 82 | —7 | June 16 | 10,000,000 | 8 | 2 Q. | Oct., 1907 |
| Niles-Bement-Pond | 104 | ..... | Feb. 2 | 8,500,000 | 6 | 1½ Q. | Dec., 1909 |
| Niles-Bement-Pond, pr | 104 | ..... | | 2,000,000 | 6 cum. | 1½ Q. | Nov., 1909 |
| Otis Elevator Co | 54 | —2 | Mar. 21 | 6,375,300 | 3 | 1½ S. A. | Oct., 1909 |
| Otis Elevator Co., pr | 97 | ..... | | 6,295,000 | 6 n. c. | 1½ Q. | Jan., 1910 |
| Pa. Steel | 65 | ..... | May 9 | 10,750,000 | | ..... | ..... |
| Pa. Steel, pr | 114½ | — ½ | | 16,500,000 | 7 n. c. | 3½ S. A. | Nov., 1909 |
| Pittsburg Coal Co | 22½ | — ½ | Mar. 8 | 28 104,600 | | ..... | ..... |
| Pittsburg Coal Co., pr | 75 | —2 | | 27,071,800 | 7 cum. | 1¼ Q. | Jan., 1910 |
| Pressel Steel Car | 43½ | —3⅜ | Feb. 16 | 12,500,000 | | 1 Q. | Aug., 1904 |
| Pressed Steel Car, pr | 104 | — ¼ | | 12,500,000 | 7 n. c. | 1¾ Q. | Nov., 1909 |
| Pullman | 194 | —3 | Nov. 9 | 100,000,000 | 8 | 2 Q. | Nov., 1909 |
| Railway Stl. Spring | 43 | —4 | Mar. 3 | 13,500,000 | 2 | 1 S. A. | Oct., 1908 |
| Railway Stl. Spring, pr | 104⅜ | —3⅛ | | 13,500,000 | 7 cum. | 1¾ Q. | Dec., 1909 |
| Rep. Iron & Steel | 37½ | —2¾ | Oct. 19 | 27,191,000 | | ..... | ..... |
| Rep. Iron & Steel, pr | 101 | —1 | | 20,416,900 | 7 cum. | 1¾ Q. | Jan., 1910 |
| Sloss Sheffield | 77½ | —5 | Mar. 9 | 10 000,000 | 5 | 2 Q. † | Nov., 1909 |
| Sloss-Sheffield, pr | 115 | ..... | | 6,700,000 | 7 n. c. | 1¾ Q. | Jan., 1910 |
| U. S. Pipe & Fdy. Co | 28 | — ½ | June 22 | 12,106,300 | 2 | 1 Q. | Dec., 1907 |
| U. S. Pipe & Fdy. Co., pr | 79 | +1⅜ | | 12,106,300 | 7 n. c. | 1¾ Q. | Dec., 1909 |
| U. S. Steel | 84⅛ | —2¾ | April 18 | 508,302,500 | 4 n. c. | 1¾‡ Q. | Mar., 1910 |
| U. S. Steel, pr | 123⅞ | — ⅛ | | 360,281,100 | 7 cum. | 1¾ Q. | Feb., 1910 |
| U. S. Steel, 5s | 104⅛ | — ⅞ | | 463,798,000 | 5 | ..... | ..... |
| Va. Iron, Coal & Coke | 66 | — ⅞ | Sept. 20 | 9,073,680 | | ..... | ..... |
| Westinghouse Elec | 71⅛ | —4⅞ | July 27 | 27,173,200* | | 1¾ Q. | Oct., 1909 |
| Westinghouse Air Brake | 144 | +1 | Oct. 4 | 14 000,000* | | 4 Q. | Oct., 1909 |

†Includes deferred dividend of ¾ of 1 per cent.
Par value of shares, $100, except those starred (*), $50.
‡Includes ¾ per cent extra.

### Copper Stocks.

**New York.**—Amalgamated Copper closed at 82, ex-dividend, a decrease of 1¼.

**Boston.**—Butte Coalition closed 26, a decrease of ¾; Calumet & Arizona closed 47½, a decrease of 12½; Calumet & Hecla closed 640, a decrease of 15; North Butte Mining closed 41, a decrease of 5; Quincy Mining closed 85½, a decrease of 2½.

### Financial Notes.

Butte Coalition has declared the regular quarterly dividend of 25 cents a share, payable Mar. 1 to stock of record Feb. 11.

The National Lead Co. has declared a quarterly dividend of 1¾ per cent on preferred, payable Mar. 15, books close Feb. 18.

# THE IRON TRADE REVIEW

**Devoted to Iron and Steel Manufacture and to the Machinery, Metal-Working and Foundry Trades.**

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

| | |
|---|---|
| January | 5,506 |
| February | 5,346 |
| March | 5,396 |
| April | 5,508 |
| May | 5,533 |
| June | 5,551 |
| July | 5,572 |
| August | 5,597 |
| September | 5,609 |
| October | 5,628 |
| November | 5,634 |
| December | 5,662 |

February 3, 1910


## THE BASIS OF RAIL DEMAND.

Misapprehensions as to the nature of rail demand have led to unwarranted expectations as to future demand. There has been disappointment already that rail tonnage has not shown up better in the general revival in demand for iron and steel products, and it is well that the basis of rail demand should be pointed out so that further disappointment may be avoided by those who are willing to devote a little study to the statistics and position of this peculiar trade.

In times past, a good demand for rails has formed the basis for general prosperity in the steel trade, but conditions have changed so that rails no longer constitute the backbone of iron and steel demand. The demand for all classes of steel products has increased so rapidly that those lines which have gotten ahead or fallen behind in the race have not received the attention which might have been accorded had not the general progress been so rapid. Rails have distinctly fallen behind in the race, and that not merely in the past year or two, but over a long period of time.

A few comparisons will suffice. The increase in pig iron production has been relatively uniform. Over many decades the average increase in tonnage has been represented by a doubling in a trifle less than 10 years. The total production of rolled iron and steel has in the past two decades followed much the same rule. The total was 5,236,928 tons in 1889, a record, 10,294,419 tons in 1899, also a record, and 19,588,468 tons in 1906, a new record, which was slightly passed in 1907. The rate of increase over this period was substantially as rapid as the general rate in pig iron. Due to the fact that steel did not altogether create a new demand, but largely supplanted iron, the increase in steel production has been at a still more rapid rate. The production of steel ingots and castings in 1886 was 2,562,503 tons, a record. It doubled in 10 years, to 5,281,689 tons in 1896. The next doubling required but three years, since in 1899 10,639,857 tons were produced, and then six years later, in 1905, 20,023,947 tons were produced, so that there was practically a quadrupling in nine years.

The growth of rail manufacture has been along totally different lines. The rail trade stands by itself, the tonnage having been governed by conditions of its own and entirely distinct from those which have governed the demand for iron and steel as a whole. Against a decennial doubling in pig iron and rolled iron and steel, and a still more rapid doubling in steel production, there have been long periods in which rails have not merely failed to gain, but have actually failed to continue their pace. In 1887, the rail production was 2,139,640 tons, but it was not until 1899, 12 years later, that such a tonnage was made again. In that same period, pig iron production doubled and steel production tripled. The best rail year of all was 1906, but it fell quite short of doubling the 1899 production, while pig iron almost doubled and steel did considerably more than double. Evidently the rail demand was governed by rules of its own.

In most finished steel products, the only index to consumption is the production, the channels of consumption being so varied and uncertain that they cannot be studied from a tonnage standpoint. One would not attempt, for instance, to estimate tin plate consumption by the number of cans produced, or structural steel consumption by the number and size of bridges and buildings erected. The only index in tin plate is the production of the tin mills, and the only index in fabricated material is the output of the fabricating shops, with perhaps a hint from the statistics of shape production.

Rails can be studied in their consumption, although from the curious predictions which are sometimes made it is evident that the opportunities afforded for study have rarely been embraced. Rails, of course, are used for laying new tracks, and for replacement, but the relative consumption in these two directions has varied widely. The first rails laid were iron rails. Before the advent of the steel rail, about 1867, several hundred thousand tons of iron rails a year were produced. These rails were light, averaging not far from 50 pounds per yard, and the maximum number of miles of track laid in iron rails was probably found in the late seventies, at something over 80,000 miles. The steel rails were used partly to replace iron rails and partly to lay new track. It was not until about 1890 that the number of miles of iron track was reduced by one-half, but in the same period the total length of track was doubled.

The first steel rails laid were light

sections, and as train loads and speeds became greater it became necessary to replace these light sections with heavier sections. Then comes the matter of actual wear. Rails do wear out, but they do not wear out, in the country at large, nearly as fast as is popularly supposed, and as a matter of fact the tonnage of rails which has thus far been required to replace rails which have merely worn out in service has been very small. Rails are not wearing out so very rapidly now, yet the ton-mileage of freight in the country in 1907 was double what it was in 1897 and almost triple what it was in 1890. Obviously rails were not being worn out very rapidly in those days.

In the early days, then, the chief rail demand was for the laying of new track; in later years came the demand for replacing iron rails, or light steel rails, with heavy steel rails, and in the present and for the future is the demand for rails to replace rails merely because they have worn out. The high point in demand for new track was reached in 1887. The high point in demand for replacement of lighter by heavier sections came in 1905-6-7, and the high point in demand for rails merely to replace worn out rails will come in the future. It will be distinct, however, in not constituting an isolated high point, since a demand of this sort promises to increase indefinitely.

The greatest annual increase in number of miles of track in the country was in 1887, with 16,983 miles. No such increase is to be expected again. This country has a mile of steam railroad for every 13 square miles of area, and a mile of track for every nine square miles of area. The chief work of railroad building has been done.

While a study of statistics is not usually the most pleasant road for the discovery of fundamental truths, it chances that the statistics of rail consumption and railroad building lend themselves to a simple and comprehensive presentation, in comfortable round figures. Grouped according to their bearing, the statistics illustrate strikingly the changes which have occurred in the character of rail consumption. Figures approximately representing the consumption are compiled, by taking production plus imports less exports. There are approximate lines of demarkation, which chance to divide the past 27 years into three periods of nine years each. The statistics for these nine-year periods are given below, showing apparent consumption in the period and increase in total length of steam track in the period:

| Years Inclusive | Consumption Gross Tons | Track increase Miles. |
|---|---|---|
| 1881-89..... | 13,034,521 | 86,441 |
| 1890-98..... | 12,959,835 | 43,151 |
| 1899-1907..... | 25,809,620 | 78 794 |

The figures representing apparent consumption are very simple. In each of the first two nine-year periods there was about 13,000,000 tons. In the third period there was double this quantity. In the first period the total length of track increased by 86,000 miles. In the second period it increased just half as much, with rail consumption unchanged. In the third period, when rail consumption was twice as great, the increase in track was slightly less than in the first period.

In a rough way one can estimate the tonnage of rails required for the track increase in each of the three periods. It requires 157 tons of rails to lay a mile of track in 100-pound rails. Assuming an average of 65-pound rails used in the first period, about 8,800,000 tons of rails were required for the new track, which would be a trifle over two-thirds of the total consumption, the balance being in renewals and in laying street car lines, industrial track, etc. Assuming an average of 75-pound rails in the second period, about 5,100,000 tons were required for the new track, or about two-fifths the total consumption. Assuming an average between 80 and 85-pound rails for the third period, 10,000,000 tons would be required for the new track, or again about two-fifths of the consumption.

The first nine-year period, 1881 to 1889 inclusive, comprises pretty closely the greatest period of new railroad building in the whole history of the movement. The increase in 1881 was 14,808 miles of track, diminishing in immediately following years, but reaching 16,983 miles in 1887, and a subsidiary high point of 10,712 miles in 1889, and as seen about two-thirds of the 13,000,000 ton rail consumption in the period was for laying new track. There was a decrease of over 30,000 miles in the length of iron track in the period, which accounts for by far the major part of the other third, so that we are able to follow perhaps 85 or 90 per cent of this rail consumption right to its place on the ties, in the next period, new track accounted for but two-fifths the total consumption. There was a decrease of 25,000 miles in iron track, which accounts for about a fourth more, leaving less than 5,000,000 tons, for the whole nine years, for more replacement purposes.

Coming again to the third period, the new track accounted for only 10,000,000 tons of the 25,000,000 tons consumption, while the replacement of iron track was almost negligible. In that nine-year period, making full allowance for traction lines, industrial uses, etc., there was well above 10,000,000 tons of rails which evidently went into replacement, more than double the tonnage of the previous nine years.

The two great movements, first of building the railroads and then of bringing the important lines up to a standard of section suitable to the traffic, have been accomplished. The work has been done in bursts, as financial arrangements could be made. The work of replacement as rails wear out is becoming more important each year, and it is work which must be pursued steadily, and should be paid for out of earninigs and not out of loans.

This presentation has shown nothing if it has not shown that the rail demand of the past has not been on account of standard section rails wearing out. The wear of rails is less than is generally supposed. Statistics of standard trunk lines have indicated that the annual wear, with

the maximum ton-mileage of freight yet shown, involves less than a million tons a year. The increase in track 1903 to 1908, fiscal years, was 47,000 miles, or 9,000 miles per year. The next five years promise less, but even 9,000 miles requires only 1,200,000 tons, in 85-pound rails. New track and wear promise to require, in the next few years, not over about 2,000,000 tons a year. Rails for industrial purposes, trolley lines and exports, the last named having averaged 285,000 tons a year in the past five years, will likely account for about a million tons more, making a round total of about 3,000,000 tons, which is likely to prove the average output in the next few years, some years doing better, some years not as well. The maximum production was approximately 4,000,000 tons, in 1906, and even 1907, which showed an increased pig iron production over 1906, made a loss of 10 per cent in rail tonnage. The rail trade, however, will necessarily be steadier, as the requirements will be for necessary replacements and consumption therefore will not be subject to the wide variations experienced in the past, when is depended upon new work subject to the vicissitudes of the money market.

## PROGRESS IN CONSERVATION THOUGHT.

The progress in thought which has been made since the "conservation movement" was first launched is noteworthy. The famous "White House conference" was held less than two years ago. The report of its proceedings filled a volume containing 450 pages of print 4½ by 7 inches. The papers and addresses at that conference were presumably as well thought out as the state of public knowledge permitted, for it was the greatest congress of the country's leading men that ever assembled. Nevertheless those proceedings, compared with the scope and temper of President Taft's recent conservation message to congress, show a very positive state of crudeness. Emphasis, it is true, was laid at the conference upon almost everything under the sun, so that the proper subjects were hardly neglected, but it is a striking illustration of the facility with which thought changes under proper exercise that so many subjects that were gravely exploited at the White House conference have been quickly relegated to the background.

The fact was emphasized that coal was being mined at a frightful rate, and that iron ore was being taken out of the ground and put into employment at a staggering pace. What could the country possibly do when there was no more iron ore under the surface, but billions of tons of iron and steel in useful employment above ground!

Mr. Taft urges that water power sites controlled by the government be allowed to pass into individual ownership for exploitation and not be permitted to become parts of a monopoly. He urges, in substance, that phosphate lands be so managed that the fertilizer may be utilized at a minimum expense to the owner of the soil which needs it. He advocates irrigation, reclamation of swamp land and improvement of water ways, three classes of work which involve the consumption both of coal and of iron.

The magnificent idea of saving everything for posterity has disappeared and in place of it there is appearing the sensible program of utilizing industry to improve our land and other natural facilities. This generation can leave to the next nothing better than improved waterways, an increased area of productive soil, and a large quantity of iron and steel, in machinery, steel structures and railroads. Even the coal that is buried is not in an entirely distinct category from the ore that is smelted and converted into iron and steel, for the burning of much of the coal is in connection with developments that lead to conservation. The burning of one ton of coal may accomplish results which ultimately will make the burning of a second ton unnecessary. There is progress even in that.

## PRODUCTION OF IRON AND STEEL IN SWEDEN.

Office of THE IRON TRADE REVIEW,
Post Bldg., Washington, D. C., Feb. 1.

Statistics of Swedish iron and steel production, and prices of iron products in the markets of Sweden have been sent to the Bureau of Manufactures, Commerce Department, from Gothenburg.

During the nine months, ending with September last, the pig iron production was 384,000 tons; blooms, 83,000 tons; Bessemer ingots, 48,300 tons, and of Martin ingots 190,000 tons. At the end of the period, there were in operation 66 blast furnaces, 186 hearths, 18 Bessemer furnaces and 46 Martin furnaces.

The total export of pig iron, ingots, blooms, bar iron and wire rods during the nine months ended Sept. 30, 1909, amounted to 212,200 tons. The average export of these articles during that period of the last 10 years was 226,700 tons.

It was remarked that the effect of the great labor conflict on Sweden's productions of iron and steel during the third quarter of 1909 and on the exports up to the end of October, 1909, could be seen in the figures submitted. It was further stated that owing to the decrease in the production the supply of Swedish rolled iron, in Sweden as well as abroad, has been exhausted, causing an inrush of orders so that all the rolling mills are busy. It was said that orders for immediate delivery are still coming in, that large contracts have been made for future delivery, and that the prices of all articles of iron have been raised, but chiefly for blooms and rolled iron of the Lancashire type.

The iron market was considered firm, with increasing prices, and on the whole the prospects were considered good.

The Gothenburg standard quotations, without discount, of the Swedish Iron Works' association for Lancashire iron were as follows, on Nov. 25, 1909, per ton of 2,240 pounds: Ordinary hammered iron, $51.10; ordinary rolled iron, $48.67; rolled iron of small dimensions, $49.28.

## UNION FURNACE SOLD.

The Union Furnace Co., of Ironton, O., has been sold by Rogers, Brown & Co. to an incorporated company, the personnel of the officers being as follows: President, J. K. Pollock, Cincinnati; vice president, D. B. Meacham, Cincinnati; secretary and treasurer, H. E. Turner, Cincinnati; assistant secretary, S. S. Littlejohn, Ironton; manager, W. M. Jefferys, Ironton. The capital stock of the new company is $300,000.

## SHORT LIVED

**Dreadnoughts of the Steel World—Mr. Talbot on Present Tendencies.**

Below are given extracts from a pamphlet recently published by Benjamin Talbot, managing director of the Cargo Fleet Iron Co., Ltd., Middlesboro, Eng., under the title, "Our Declining Steel Trade." The contrasts which he draws between British iron and steel manufacturing conditions and those prevailing in Germany and the United States are interesting, as is also his comment upon the market about to be lost by the building of steel works in India. Mr. Talbot might have added that a Pittsburg engineer, William Kennedy, is the engineer of the Tata plant.

The question will be asked, Why are our steel works not advancing step by step with Germany and America, and why cannot we rebuild our plants and extend them by putting down these immense units which they are erecting? In both the countries named the home market is protected and is not subject to those periodical piratical attacks to which ours is whenever any depression occurs. In other words, with them capital is preserved and protected, whilst with us, under the present policy of "dumping" and export bounties with which we have to contend, capital in steel works has no protection.

There is an entire change in the size of the unit with which we have to compete, and in the methods of manufacture, even since 1897. What has occurred in naval matters in evolving the Dreadnought type of battleship in order to keep our supremacy in naval warfare has also come to pass in steel works for the purposes of commercial warfare. The modern steel works of our competitors are situated alongside the blast-furnaces, and liquid pig iron is converted into steel without cooling, and the excess energy given off by the blast furnaces in the form of waste gas is turned into electrical power by means of gas engines. A Dreadnought has at the most only about 25 years of actual work in the first rank. A steel works is subjected to the same law of progress. If we cannot keep our works in operation and make profits we cannot make provision for keeping the works up-to-date, and thus we eventually find ourselves with an obsolete plant on our hands which is rapidly scrapped and the capital originally invested is lost.

Recently the Tata Steel & Iron Co. desired to erect blast furnaces and steel works to roll rails to supply the Indian market, and they obtained the help of the Indian government, who ran a railroad to their mines, and also gave them an order for 200,000 tons of rails. Many of the large works in Cleveland district sent quotations for parts of the requisite material. Few of the contracts were given to British firms. Germany has been specially favored in supplying the iron and steel work required in the erection of the blast furnaces and steel works, as well as for the engines and electrical equipment connected with the rolling mills. America has obtained locomotives. It will be said that British prices were too high, but British manufacturers of these products cannot continue to exist if they are to compete against the German method of export bounties which enables their competitors to attack the trade in the way they do.

During the past 10 years we have shipped to India 1,078,000 tons of steel rails, or an average of 107,000 tons per year; the plant which is building will be capable of supplying India with all its present consumption of steel rails, and this trade will therefore be lost to this country.

## READING PLACED SUBSTANTIAL ORDERS.

The Reading Railway Co. has placed some substantial orders for delivery during 1910. They include 25,000 tons of rails, 40 new freight and coal engines, several freight and coal cars, 50 passenger and baggage cars, 18 iron bridges for the Perkiomen road and the completion of a lot of new work.

## NO CHANGE IN ACTIVE STACKS.

Blast furnaces in the Reading district have continued to run since the first of the year without change. No new furnaces have been blown into blast and none have gone out. The Reading Iron Co.'s furnace at Emaus will likely be blown in the later part of February, or early in March.

## INCREASED ITS CAPITAL.

The Scullin-Gallagher Iron & Steel Co., St. Louis, at a recent special meeting of the stockholders, increased its capital stock from $750,000 to $1,500,000, and authorized the issuance of bonds to the amount of $1,500,000, secured by a mortgage on all of its property. The statement is made that the company contemplates no immediate improvements or extensions, but that the money to be borrowed will be used as working capital made necessary by the increase of business.

## FOUNDRY IN OPERATION.

The plant of the Central Machine & Foundry Co., Marion, Ind., which was recently placed in operation for the first time, will manufacture high grade castings exclusively. The main building is 80 x 299 feet with entirely new equipment driven by electricity. Cecil C. Chamberlain, of Parkersburg, W. Va., is secretary-treasurer of the company, and Addison Meyer of Detroit is superintendent of the foundry.

## SCRAP RULING MODIFIED.

**Treasury Department Interprets Tariff Provisions in a More Generous Manner.**

In a letter to the collector of the port at Philadelphia, Assistant Secretary of the Treasury Curtis, makes clear the manner in which the scrap clause of the 1909 tariff act will hereafter be interpreted. The text of his letter is given below:

Since the publication of the department's instructions to you of Oct. 23, 1909 (T. D. 30063), relative to scrap iron and scrap steel, the department has received many requests from persons interested in the business of remanufacturing these commodities for further consideration thereof.

In determining the interpretation to be placed upon paragraph 118 of the tariff act of 1909, the important point to be borne in mind is the intention of the congress, as indicated by the change in the rate of duty upon scrap from $4 to $1 per ton. It is not only a matter of common knowledge, but also within the specific knowledge of the department that congress intended scrap iron and scrap steel to be imported with a duty of $1 per ton; and that congress did not intend to permit the entry as scrap, of iron and steel not really waste or refuse. In order to give full effect to the primary intent of the statue, *i. e.*, the lowering of the tariff on scrap, the defining clause must be interpreted in a manner that will not render nugatory the principal clause immediately preceding it. In other words, a proper and just construction demands that more stress be laid upon the clause by which the duty is lowered than upon the clause excepting certain materials from the operation of the paragraph. The department is of opinion that the phrase "Fit only to be remanufactured by melting and excluding pig iron in all forms" was intended by congress to be a more accurate definition of the term "Scrap iron and scrap steel" than was contained in the Act of 1897, and was not intended in any way to be a further limitation thereof.

After a careful investigation into the methods of remanufacturing waste or refuse iron or steel now in operation, the department is of opinion that all scrap iron and scrap steel is dutiable at $1 per ton except such as can be profitably remanufactured by a process of rolling, hammering or cutting, or any other process which does not include the complete change of form of the material by fusion caused by the application of heat.

T. D. 30063 is hereby modified accordingly.

## WILL BE NAMED FOR McDONALD.

The new group of merchant bar mills to be erected near Girard, O., by the Carnegie Steel Co. will be named the "McDonald Bar Mills," after Thomas McDonald, general superintendent of the Carnegie Steel Co.'s plants in the Youngstown district.

## ORE HANDLING DIFFICULTIES.

### Eastern Furnacemen Find Present Winter One of the Worst on Record.

Philadelphia, Jan. 26.

There is general complaint among eastern furnacemen that the handling of iron ore during the current winter, because of severe weather, has been more difficult than for a great many years. There is no interruption of foreign ore shipments during the winter months, with the exception of that coming from Newfoundland, and to some extent from Sweden, and the practice of domestic miners in the east is to ship steadily through the year, even from points as far north as the Mineville district. Receipts of foreign ore during January are certain to establish a new record by a considerable margin, hence the matter of handling the material at the furnace yards is a serious one.

In several instances, where unloading facilities have not been equal to the rush of cars from seaboard points and delay has been occasioned, the fall of snow, followed by a thaw and then by extremely low temperatures, has frozen the ore to such a degree that unloading can be accomplished only at a very slow rate and at a cost several times that under normal conditions. The same is true in the case of some lake ore which was taken in late in the year against the blowing in of new furnace capacity. The application of steam for thawing out the frozen cars has been found exceedingly tedious, and the use of rotary unloading devices, such as are commonly employed at the large plants, is at considerable risk to this mechanism, as in many cases the car is frozen practically solid.

As a result of these difficulties, there has not only been an unprecedented congestion of cars at certain ore consuming centers, with embargoes at one or two points, but domestic miners have been in receipt of a good many requests for the postponement of shipments on contracts calling for deliveries beginning with Jan. 1. In the aggregate, a considerable tonnage of ore has been held up in this way, necessitating the accumulation of stock piles at mining or shipping points.

## TWO STEAMERS LAUNCHED.

The bulk freighter, Leonard B. Miller, was launched from the yard of the American Ship Building Co. for Capt. W. C. Richardson, of Cleveland, on Saturday, being named in honor of Mr. Miller, of the firm of Oglebay, Norton & Co. The vessel was christened by his daughter Helen. The new steamer is 524 feet over all, 504 feet keel, 54 feet beam and 30 feet deep, and will carry 9,000 tons of ore.

The steamer John P. Reiss was launched from the Lorain yard of the American Ship Building Co. on Saturday. This steamer was originally ordered by John J. Barlum. She was sold by him to the Reiss Coal Co. while on the stocks. She is also of the 9,000-ton class and will be operated by the Wisconsin Transit Co.

## EXTENSION PLANS FOR GRANITE CITY PLANTS.

The American Steel Foundries is planning to expend $500,000 on its works at Granite City, Ill., between now and June 1, according to statements made by President W. V. Kelley and other officers who have just finished an inspection of the plant. A new building 400 x 600 feet will be constructed and equipped at a cost of $350,000, while $150,000 will be expended on bringing the two present buildings up to date. In the latter additional furnaces will be installed as well as 25,000 horsepower in engines and batteries of boilers. By the first of the month 600 workmen will be added to the payrolls.

## FOREIGN RAIL TRADE.

The German Steelworks' Union will supply 35,000 tons of standard rails for Argentine republic. This is in addition to the order for 60,000 tons recently placed with British merchant interests. Inquiries are in the market from India and Burma for 10,000 tons, and Blockow, Vaughan & Co. have received an order for 11,000 tons for the Great Eastern railway. During 1909, Great Britain shipped over 175,000 tons of rails to Argentine republic, and about 14,000 tons to Chili. Its total rail exports were 571,524 tons.

## FOUNDRY WAS SOLD.

The plant of the Delphos Foundry & Mfg. Co., Delphos, O., has been sold to the Contractors' Supply Co., of Lima, O. The plant includes a foundry and eight acres of land. The new company, organized to take over the Delphos plant, is capitalized at $50,000, and has these officers: President, W. T. Agerter; vice president, George Feltz; general manager, C. L. Moore; secretary - treasurer, A. C. Phelps.

## ROYALTY IMPOSED

### By Government on Bell Island Ore—New Construction.

Toronto, Can., Jan. 29.

The government of Newfoundland has imposed a royalty of 7½c per ton on the gross output of the hematite ore mines at Bell Island, the product of which averages about 1,000,000 tons annually. The companies affected by this impost are the Dominion Iron & Steel and Nova Scotia Steel & Coal Cos., both of which draw extensive supplies from this source.

The Otis-Ferisorn Co., elevator manufacturer, of Hamilton, Ont., is making considerable extension to its plant, including a new foundry, 110 x 160 feet, of brick and steel, and a steel addition to the machine shop, 200 feet long, with a right-angle extension, 100 x 100 feet, also of steel. The contract price for these buildings is over $100,000. Other buildings will be erected, and when these are completed and equipped the total cost of all the additions will run between $200,000 and $250,000.

## BOILER COMPANY LEASES SPACE AT ST. LOUIS.

The Kewanee Boiler Co., Kewanee, Ill., has leased the ground floor of a building at the northeast corner of Twelfth and Olive streets, St. Louis, to be used as a room in which to exhibit and sell the radiators and various heating apparatus which the company makes. The lease was obtained from W. W. Culver, owner of the building, for five years, at an annual rental of $7,500. Otto Dieckman Jr. will be in charge of the office.

## CANADIAN INDUSTRIAL NOTES.

The Canadian government has appointed A. W. Campbell, now deputy minister of public works for Ontario, to the position of deputy minister of railways, in place of Matthew J. Butler, who recently resigned. Mr. Campbell is widely known in connection with his work for the improvement of provincial highways.

A branch of the Canadian Manufacturers' Association has been organized at Hamilton, of which Robert Hobson, of the Hamilton Steel & Iron Co., was elected chairman.

The International Harvester Co., of Hamilton, Ont., has decided to spend $100,000 in improvements on the plant, including a new building to be used as a machine shop.

## MORE FACTORIES

### Wanted by Seattle—Efforts of the Chamber of Commerce.

A serious campaign for more factories has just been inaugurated by the Seattle Chamber of Commerce. A fund of $15,000 has been raised by popular subscription to defray the expenses of a special industrial bureau attached to the chamber. This bureau will collect data bearing on market conditions, local competition, sources of raw material, wages, labor conditions, railroad facilities, freight rates, etc., to which a manufacturer proposing to locate in Seattle will have free access. The bureau will also assist in securing suitable sites for new industries at reasonable prices.

It is announced that the work will be conservatively administered and that only such industries as can thrive under local conditions will be encouraged, due respect being given at all times to concerns already in the field. The plan does not include the granting of subsidies, bonuses or free sites, it being the intention to assist only such institutions as have sufficient financial backing to stand on their own feet.

Considerable attention will be paid to the metal industries and the recent location of the Perfection Brass & Iron Bed Co. in Seattle is one of the first fruits of the efforts of the new industrial bureau.

## NIGHT SCHOOL FOR APPRENTICES ORGANIZED BY THE PHOENIX ENGINEERING CO.

A night school has been recently opened by the Phoenix Engineering Co., Tacoma, Wash., for the benefit of its apprentices and other employes who care to avail themselves of the opportunity.

The Phoenix Engineering Co. operates machine shops, forge shops and foundries, specializing on ship construction and repairs and on the manufacture of marine engines and boilers. The courses of study are designed to fit in with the particular work in which the company is engaged, the aim being to build up a corps of skilled workmen who will have a personal interest in the business.

The subjects covered at the night school are mechanical drawing, geometry, arithmetic and lectures on shop practice. As soon as they are sufficiently advanced, the apprentices are given practical work in the drawing room, while their days, of course, are spent in the shop. Sessions are held twice a week, so that the course will not be a burden on anyone's time. The instruction is given by the department heads. The school work is carried on without expense to the apprentices.

## TEST OF A NEW LATHE.

A large gathering of railroad and machinery men took place at Hamilton, Ont., yesterday, to witness a test by the London Machine Tool Co. of a new coach wheel lathe, intended to turn out wheels in half the usual time. The party included representatives of the Canadian Pacific railway and shops, Montreal, the Grand Trunk railway shops at Montreal, London and Stratford, and several machinery firms. The test was successful notwithstanding a slight accident caused by the falling of a wedge into the machinery. A pair of coach wheels was turned out in 25 minutes and those present were satisfied that it could be done in 20 minutes. The party took lunch at the Hamilton Club and afterwards visited the leading plants of the city.

The Dominion Coal Co. has appointed C. S. Cameron as acting secretary and D. H. McDougall as general superintendent of mines.

## LABOR ORGANIZATIONS MAKE LITTLE PROGRESS.

Reports from Los Angeles, Cal., where the organized labor interests of the Pacific coast are at present concentrating their efforts in an endeavor to force the eight-hour day on the western iron industries, indicate that the labor unions are making but little progress. Efforts to unionize the machine shops and foundries of Los Angeles are meeting with strenuous opposition. The Founders' and Employers' Association has issued a statement declaring that the members of the association will maintain open shop conditions or go out of business. Up to the present time there have been no converts to the union side in the shops belonging to the association.

Representatives of about 60 Philadelphia concerns, among them a number of manufacturing interests in the iron and steel field, will start Feb. 1 on a three days' tour through the principal cities of eastern and central Pennsylvania. This is termed a "trade expansion excursion," and is under the auspices of the Merchants' and Manufacturers' Association.

## NOT CONFIRMED

### Was Sale of Bird Iron Co.—Death of Thos. N. Martin.

Acting upon the request of a member of the firm of Eaton & Rhodes, of Cincinnati, a former stockholder, the sale of the Bird Iron Co. to D. C. Davies, of this city, for $99,000, was not confirmed yesterday as had been anticipated. Judge E. E. Corn deferred passing on the matter of confirmation until the stockholder should present his objections more specifically.

Within the past week death has once more invaded the ranks of the iron men and taken Thomas N. Martin, head bookkeeper for the Belfont Iron Works Co., of this city. Mr. Martin was for many years connected with Means, Kyle & Co., one of the pioneers in the iron industry of this section. He had been with the Belfont company for the past ten years. He is succeeded by Carl W. Moulton, and C. B. McQuigg is added to the office force.

The Ironton Engine Co. has completed a blowing engine for the Ironton Iron Co. and it will be installed at once.

## BRITISH IRON EXPORTS.

### United States Second Only to Italy as Buyer in 1909.

New York, Jan. 26.

According to official reports, Great Britain in 1909 sent a total of 153,778 tons of pig iron to the United States, against 69,823 tons in 1908. Exports of iron to Italy were slightly larger, being 156,869 tons, though considerably less than in 1908. The following table shows the exports of pig iron from Great Britain during the past two years:

| | 1908. | 1909. |
|---|---|---|
| Sweden | 67,911 | 58,079 |
| Germany | 270,886 | 133,775 |
| Holland | 144,807 | 68,531 |
| Belgium | 78,167 | 70,875 |
| France | 131,881 | 119,702 |
| Italy | 217,859 | 136,869 |
| Japan | 60,033 | 89,444 |
| United States | 69,823 | 153,778 |
| British East Indies | 23,983 | 20,023 |
| Australia | 30,466 | 30,679 |
| Canada | 39,692 | 98,365 |
| Other countries | 158,537 | 136,249 |
| Total | 1,294,045 | 1,136,369 |

Great Britain imported 6,328,613 tons of iron ore during the year, 4,725,914 tons coming from Spain.

The Whitman Agricultural Implement Co., St. Louis, is constructing a three-story brick warehouse, 52 x 110 feet.

# SPECULATION IN INDUSTRIAL SECURITIES

## Steel Common Was a Favorite Throughout Last Year, Being Second Only to Amalgamated Copper—Wide Distribution Following the Panic.

During 1909 every share of the United States Steel Corporation's common stock changed hands an average of over five times. There are 5,083,025 shares of this stock outstanding, and transactions on the New York Stock Exchange totaled 26,689,800 shares. Similarly, the common stock of the Colorado Fuel & Iron Co., though by no means one of the most active securities on the exchange, showed transactions equivalent to more than four times the amount outstanding, and other instances might be multiplied to indicate the favor which the iron and steel industries enjoy with the trading public.

In 1909, in point of total shares changing hands, the Corporation's common stock was second only to Amalgamated Copper among the industrials and third among all the securities listed. The following table, giving the number of shares changing hands on the New York Stock Exchange during the year in contrast with the total number of shares outstanding, shows that in almost half of the securities listed transfers were in excess:

| Stock. | Shares sold '09. | Shares outstanding. |
|---|---|---|
| Allis-Chalmers, com. | 149,650 | 198,200 |
| Allis-Chalmers, pref. | 248,104 | 161,500 |
| American Can, com. | 703,040 | 412,333 |
| American Can, pref. | 395,318 | 412 333 |
| American Car & Foundry, com. | 918,990 | 300,000 |
| American Car & Foundry, pref. | 32,476 | 300,000 |
| American Locomotive, com. | 546,798 | 250,000 |
| American Locomotive, pref. | 29,044 | 250,000 |
| American Steel Foundries | 130,269 | 171,840 |
| Bethlehem Steel, com. | 218,021 | 148,620 |
| Bethlehem Steel, pref. | 47,970 | 149,080 |
| Colorado Fuel & Iron, com. | 1,496,770 | 342,355 |
| Colorado Fuel & Iron, pref. | 4,320 | 20,000 |
| General Electric | 254,729 | 651,796 |
| International Harvester, com. | 151,395 | 600,000 |
| International Harvester, pref. | 85,203 | 600,000 |
| International Steam Pump, com. | 403,230 | 177,625 |
| International Steam Pump, pref. | 135,123 | 113,500 |
| Pressed Steel Car, com. | 367,392 | 125,000 |
| Pressed Steel Car, pref. | 36,467 | 125,000 |
| Pullman | 37,254 | 1,000,000 |
| Railway Steel Spring, com. | 154,552 | 135,000 |
| Railway Steel Spring, pref. | 20,981 | 135,000 |
| Republic Iron & Steel, com. | 983,075 | 271,910 |
| Republic Iron & Steel, pref. | 252,605 | 25,000 |
| Sloss-Sheffield, com. | 207,661 | 100,000 |
| Sloss-Sheffield, pref. | 5,834 | 67,000 |
| United States Cast Iron Pipe, com. | 95,471 | 121,063 |
| United States Cast Iron Pipe, pref. | 56,511 | 121,063 |
| United States Steel, com. | 26,689,800 | 5,083,025 |
| United States Steel, pref. | 1,339,720 | 3,602,811 |
| Virginia Iron, Coal & Coke | 23,633 | 90,736 |

The securities of the Steel Corporation are in the hands of over 100,000 stockholders, giving these stocks a wider distribution than those of any other interest, in spite of the fact that this figure does not include a large number of individual shareholdeers represented by blocks of stock in the hands of foreign holding companies. Yet, in common with several of the other steel interests, the Corporation's list of stockholders decreased materially during the past year, this being explained by the general profit-taking by numerous investors who invaded the markets when bargain - counter prices prevailed on standard securities during the panic period in the early weeks of 1908.

Statistics are available to show that American stocks were most widely distributed immediately following the panic and that the number of their holders decreased steadily as the recovery progressed. Table A, on the following page, gives the number of stockholders of leading iron, steel and equipment companies at or about the close of 1908 and 1909, compiled from reports made to the New York *Journal of Commerce*. Notable increases were recorded by the International Harvester Co., which enjoyed an extremely profitable year because of agricultural activities, and the Westinghouse Electric and Mfg. Co., evincing the restoration of its normal activities. Another feature apparent from this table is the limited distribution of the Pennsylvania Steel Co's common stock.

The popularity of Steel common, with the speculating and investing public lends interest to its remarkable fluctuations since the organization of the Corporation nine years ago. During 1901 its range was between 24 and 55 and in 1902 between 29¾ and 46¾; then, continuing a decline started late that year, the stock sagged steadily through 1903 to its historic low figure of 8⅜. In 1905 the range was 24⅞ to 43¼, and in 1906 from 32⅝ to 50¼. The panic which reached its worst late in 1907 sent this security down to 21⅞, from which level a recovery movement of phenomenal steadiness carried it up past all previous high records to within an eighth of 95 early in October.

This advance was taken advantage of by numerous speculators, big and little, and stories of almost fabulous profits continue to develop. An extreme case is on record in which, through his introduction to a brokerage house by an influential friend, a clerk was permitted to buy 40 shares of Steel common on a $5.00 margin, securing the stock low in the twenties. The advance setting in immediately, this margin was never in danger and the stock was sold recently at a profit of over $2,700 on the $200 investment. Following which, the story goes, the speculator took a plunge in copper mining stocks and saw his winnings wiped out in three days.

### On Other Exchanges.

On the Philadelphia exchange, Steel common was the most active stock during 1909, showing transactions of over 2,150,000 shares, or about one-twelfth the volume of trading in this security on the New York exchange. Three railway stocks showed transactions of over 1,000,000 shares each, and these were closely followed by Cambria Steel Co. and the Lake Superior Corporation, each with slightly under 450,000 shares. These two stocks, with Cambria Iron, Pennsylvania Steel common and preferred, and Warwick Iron & Steel, find practically their sole market on this exchange, which also shows limited activity in Bethlehem Steel, Colorado Fuel, Republic preferred and common, and United States Pipe & Foundry.

Important bond transactions on the Philadelphia exchange are usually limited to two bonds among the iron and steel securities,—Lake Superior Corporation fives, selling last year to the extent of about $2,750,000 par at prices ranging from 46 to 57, and Spanish-American Iron Co. sixes, guaranteed by the Pennsylvania Steel Co. and selling slightly above par to the extent of over $300,000. Bethlehem Steel fives and sixes, Midvale Steel fives and United States Steel fives were also traded in to a limited extent on the

Philadelphia exchange during the year.

Quotations on certain of the relatively inactive stocks are regularly given at various local exchanges. For instance, Cincinnati financial pages carry current prices on Barney & Smith, J. A. Fay & Egan, Niles-Bement-Pond and a few others of this class; Pittsburg traders deal quite actively in Crucible Steel, Pittsburg Coal and Harbison-Walker Refractories; Baltimore is the center of activity for Alabama Consolidated Coal & Iron Co. stocks and bonds; Cleveland trades in American Shipbuilding, which is also active at Chicago, along with American Can, Chicago Pneumatic Tool and a few other industrials of this class.

### Inactive Industrials.

The securities of many important industrials are not listed on any of the exchanges, while others which are listed locally are so closely held that transfers are infrequent. Yet these corporations include a number of high standard in the iron and steel producing and consuming fields, hence their securities are much sought after for permanent investment, and several brokerage houses in the larger trading centers confine their operations entirely to stocks and bonds of this class. These securities are generally avoided by the speculating public for the reason that they are comparatively little known, usually are difficult to secure and on the other hand offer little opportunity for prompt and profitable disposal in times of stringency, such as is enjoyed by the active industrials. There stocks are commonly on a rather high dividend basis, with payment records stretching back unbroken over a considerable term of years, and in many cases having no funded debt and carrying an ample surplus.

A typical instance is furnished by the securities of the American Brake Shoe & Foundry Co., which practically acquired control of the brake shoe output of the country through the consolidation, early in 1902, of six large interests engaged in the manufacture of this important line of railway supplies. Its present annual capacity is estimated at 150,000 tons, various classes of railway steel castings being produced. The preferred stock, of which $3,000,000 is outstanding, is 7 per cent cumulative and this has been regularly paid; on the $2,140,000 of common stock outstanding, 3 per cent was paid originally, with 4 per cent each year since 1903 and an extra 1 per cent in 1908. There is a funded debt of $880,000 first mortgage 5 per cent bonds, maturing in 1952, but subject to earlier retirement. There is no regular trading in these securities, but a steady demand for investment purposes is evidenced by the fact that small blocks are frequently advertised for and occasionally offered in the financial press. Other corporations, the stock of which is similarly dealt in, include American Radiator Co., American Iron & Steel Mfg. Co., American Screw Co., the Babcock & Wilcox Co., the E. W. Bliss Co., Crocker-Wheeler Co., Joseph Dixon Crucible Co., J. A. Fay & Egan Co., Garvin Machine Co., the New Jersey Zinc Co., Nicholson File Co., Niles-Bement-Pond Co., Otis Elevator Co., Standard Coupler Co., Standard Screw Co., Thomas Iron Co., Henry R. Worthington, Yale & Towne Mfg. Co., Singer Mfg. Co., Youngstown Sheet & Tube Co., and Woodward Iron Co.

### The New York Curb.

Although New York's unique open-air market, commonly termed the "Curb," limits its activities chiefly to mining stocks, these constituting perhaps 95 per cent of its entire business, it affords trading facilities for several iron and steel industrials, which for one reason or another are not listed on the Stock Exchange. Shortly after the organization of the Southern Iron & Steel Co. to take over the properties of the Southern Steel Co. during the past year, both the stocks and bonds of this new corporation were traded in actively on the "Curb," though of late transactions have not been so extensive. Central Foundry is another industrial regularly quoted on the open-air exchange and occasional sales of Empire Steel & Iron are made, although this stock is closely held and transfers are extremely few.

This picturesque market, occupying a roped-off section of Broad street asphalt near the Stock Exchange and persisting noisily in its business no matter how severe the weather conditions, impresses the chance observer as merely a confused, shouting, purposeless mob, dashing frantically from group to group, all the while gesticulating in a way to suggest anything rather than the systematic and accurate trading which is regularly carried on. This is all the more remarkable when it is considered that the machinery of the Curb moves without official control of any kind, that it serves as many as 300 brokers without a binding organization among them and that its only regulations are those growing out of precedent and dictated by a common bond of honor and a sort of tacit understanding.

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Ferd C. Latrobe Jr., and John C. Shane have instituted a suit at Baltimore to set aside the sale of the plant of the Baltimore Foundry Co. made to them last October by Dietrich Bros. The purchasers originally bought 250 shares of the company's stock for $35,000, paying $10,000 cash, the rest in promissory notes. It is alleged in the petition of Messrs. Latrobe and Shane that the statement of the company's affairs upon which they purchased the plant does not agree with the condition of affairs as they say they found them.

TABLE A—COMPARATIVE STATEMENT SHOWING NUMBER OF STOCKHOLDERS IN LEADING STEEL CONCERNS.

| Iron and Steel Companies. | Capital. | 1909. | 1908. |
|---|---|---|---|
| Bethlehem Steel, com. | $ 15,000,000 | 427 | 522 |
| Bethlehem Steel, pref. | 15,000,000 | 447 | 645 |
| Cambria Steel | 45,000,000 | 2,391 | 2,226 |
| Colorado Fuel, com. | 34,235,500 | 2,003 | 2,586 |
| Colorado Fuel, pref. | 2,000 000 | 277 | 273 |
| Crucible Steel, com. | 24,578,400 | 1,413 | 1,423 |
| Crucible Steel, pref. | 24,436,500 | 3,319 | 3,466 |
| Dominion Iron & Steel, com. | 20,000,000 | 624 | 705 |
| Dominion Iron & Steel, pref. | 5,000 000 | 1,020 | 949 |
| Lackawanna Steel | 34,978.000 | 797 | 749 |
| Pennsylvania Steel, com. | 10,750,000 | 93 | 95 |
| Pennsylvania Steel, pref. | 16,500,000 | 885 | 842 |
| Republic Iron & Steel, com. | 27,352,000 | 1,120 | 1,510 |
| Republic Iron & Steel, pref. | 25,000 000 | 2,284 | 2,730 |
| Sloss-Sheffield, com. | 10,000,000 | 669 | 647 |
| Sloss-Sheeffield, pref. | 6,523,300 | 397 | 374 |
| United States Steel, com. | 508 302,500 | 100,000 | 110,000 |
| United States Steel, pref. | 360,281,100 | | |

| Industrial Equipment Companies. | Capital. | 1909. | 1908. |
|---|---|---|---|
| Allis-Chalmers, com. | $ 19,820,000 | 2,126 | 2,004 |
| Allis-Chalmers, pref. | 16,150,000 | | |
| American Car & Foundry, com. | 30,000,000 | 9,700 | 10,373 |
| American Car & Foundry, pref. | 30,000 000 | | |
| Barney & Smith, com. | 2,000,000 | 486 | 469 |
| Barney & Smith, pref. | 2,500,000 | 470 | 448 |
| General Electric, | 65,178,000 | 9,188 | 9,188 |
| International Harvester, com. | 60,000,000 | 2,200 | 1,200 |
| International Harvester, pref. | 60,000,000 | | |
| Pressed Steel Car, com. | 12,500,000 | 1,139 | 1,304 |
| Pressed Steel Car, pref. | 12,500,000 | 2,819 | 2,812 |
| Pullman. | 100,000,000 | 10,431 | 10,393 |
| Railway St. Spr., com. | 13,500,000 | 995 | 1,048 |
| Railway St. Spr., pref. | 13,500,000 | 1,586 | 1,576 |
| Vulcan Detin., com. | 2,000,000 | 281 | 247 |
| Vulcan Detin., pref. | 1,500,000 | 283 | 251 |
| Westinghouse Air Brake, | 14,000,000 | 2,622 | 2,583 |
| Westinghouse Elec. & Mfg. | 36,705,037 | 7,112 | 2,292 |

# TOTAL PRODUCTION OF PIG IRON IN THE UNITED STATES IN 1908 AND 1909.

*Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons of 2,240 pounds.*

**Production in 1909, 25,795,471 Gross Tons; in 1908, 15,936,018 Tons; in 1907, 25,781,361 Tons; and in 1906, 25,307,191 Tons**

## Total Production of All Kinds of Pig Iron.

### TOTAL PRODUCTION OF PIG IRON BY STATES.

| States. | Blast Furnaces. In blast June 30, 1909. | Dec. 31, 1909. In. | Out. | Total. | Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1909. | Second half of 1909. | Total for 1909. |
|---|---|---|---|---|---|---|---|
| Massachusetts | 1 | 2 | 0 | 2 | 9,685 | 8,703 | 18,388 |
| Connecticut | 3 | 2 | 1 | 3 | | | |
| New York | 15 | 17 | 11 | 28 | 688,828 | 1,044,847 | 1,733,675 |
| New Jersey | 3 | 5 | 6 | 11 | 118,219 | 176,255 | 294,474 |
| Pennsylvania | 103 | 134 | 28 | 162 | 4,755,079 | 6,163,745 | 10,918,824 |
| Maryland | 3 | 4 | 1 | 5 | 115,260 | 171,596 | 286,856 |
| Virginia | 9 | 13 | 13 | 26 | 183,019 | 208,115 | 391,134 |
| Georgia | 1 | 0 | 4 | 4 | 10,101 | 15,971 | 26,072 |
| Texas | 0 | 0 | 4 | 4 | | | |
| Alabama | 19 | 29 | 22 | 51 | 800,708 | 962,909 | 1,763,617 |
| West Virginia | 3 | 3 | 1 | 4 | 63,200 | 165,082 | 228,282 |
| Kentucky | 3 | 2 | 6 | 8 | 49,580 | 36,791 | 86,371 |
| Tennessee | 9 | 13 | 8 | 21 | 152,628 | 181,217 | 333,845 |
| Ohio | 44 | 61 | 13 | 74 | 2,242,987 | 3,308,558 | 5,551,545 |
| Illinois | 19 | 23 | 3 | 26 | 1,057,874 | 1,409,282 | 2,467,156 |
| Indiana | 5 | 7 | 0 | 7 | 420,191 | 544,098 | 964,289 |
| Michigan | 7 | 11 | 4 | 15 | | | |
| Wisconsin | 5 | 6 | 1 | 7 | 171,277 | 176,900 | 348,177 |
| Minnesota | 1 | 1 | 0 | 1 | | | |
| Missouri | 2 | 2 | 0 | 2 | | | |
| Colorado | 3 | 3 | 3 | 6 | | | |
| Oregon | 0 | 0 | 1 | 1 | 183,710 | 199,056 | 382,766 |
| Washington | 0 | 0 | 1 | 1 | | | |
| California | 0 | 0 | 0 | 0 | | | |
| Total | 258 | 338 | 131 | 469 | 11,022,346 | 14,773,125 | 25,795,471 |

### PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| New York | 15 | 17 | 4 | 21 | 688,178 | 1,043,256 | 1,731,434 |
| New Jersey | 2 | 5 | 2 | 7 | 93,091 | 163,755 | 256,846 |
| Pennsylvania | 88 | 106 | 12 | 118 | 4,510,843 | 5,744,487 | 10,255,330 |
| Maryland | 2 | 3 | 1 | 4 | 114,860 | 169,496 | 284,356 |
| Virginia | 9 | 12 | 10 | 22 | 187,862 | 216,863 | 404,725 |
| Georgia | 0 | 0 | 2 | 2 | | | |
| Texas | 0 | 0 | 3 | 3 | | | |
| Alabama | 17 | 27 | 19 | 46 | 784,712 | 945,264 | 1,729,976 |
| West Virginia | 3 | 3 | 1 | 4 | 63,200 | 165,082 | 228,282 |
| Kentucky | 2 | 1 | 6 | 7 | 48,928 | 35,088 | 84,016 |
| Tennessee | 8 | 12 | 6 | 18 | 151,595 | 179,314 | 330,909 |
| Ohio | 44 | 61 | 8 | 69 | 2,242,987 | 3,308,558 | 5,551,545 |
| Illinois | 19 | 23 | 3 | 26 | 1,057,874 | 1,409,282 | 2,467,156 |
| Indiana | 5 | 7 | 0 | 7 | *440,358 | *531,479 | *971,837 |
| Michigan | 1 | 2 | 1 | 3 | | | |
| Wisconsin | 4 | 5 | 1 | 6 | | | |
| Minnesota | 1 | 1 | 0 | 1 | | | |
| Missouri | 1 | 1 | 0 | 1 | 197,967 | 226,658 | 424,625 |
| Colorado | 3 | 3 | 3 | 6 | | | |
| Washington | 0 | 0 | 1 | 1 | | | |
| Total | 224 | 289 | 83 | 372 | *10,582,455 | *14,138,582 | *24,721,037 |

* Includes a small quantity of iron made experimentally with manufactured gas.

### ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| New York | 0 | 0 | 5 | 5 | 268,502 | 429,929 | 698,431 |
| New Jersey | 1 | 0 | 4 | 4 | | | |
| Pennsylvania | 13 | 25 | 14 | 39 | | | |
| Total | 14 | 25 | 23 | 48 | 268,502 | 429,929 | 698,431 |

### PRODUCTION OF CHARCOAL PIG IRON BY STATES.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Massachusetts | 1 | 2 | 0 | 2 | 10,335 | 10,294 | 20,629 |
| Connecticut | 3 | 2 | 1 | 3 | | | |
| New York | 0 | 0 | 2 | 2 | | | |
| Pennsylvania | 2 | 3 | 2 | 5 | 862 | 1,829 | 2,691 |
| Maryland | 1 | 1 | 0 | 1 | 1,557 | 4,031 | 5,588 |
| Virginia | 0 | 1 | 3 | 4 | | | |
| Alabama | 2 | 2 | 3 | 5 | 15,996 | 17,645 | 33,641 |
| Georgia | 1 | 0 | 2 | 2 | 5,786 | 8,898 | 14,684 |
| Texas | 0 | 0 | 1 | 1 | | | |
| Kentucky | 1 | 1 | 0 | 1 | | | |
| Tennessee | 1 | 1 | 2 | 3 | | | |
| Ohio | 0 | 0 | 5 | 5 | 0 | 0 | 0 |
| Michigan | 6 | 9 | 3 | 12 | 103,733 | 128,000 | 231,733 |
| Wisconsin | 1 | 1 | 0 | 1 | | | |
| Missouri | 1 | 1 | 0 | 1 | *33,120 | *33,917 | *67,037 |
| Oregon | 0 | 0 | 1 | 1 | | | |
| California | 0 | 0 | 0 | 0 | | | |
| Total | 20 | 24 | 25 | 49 | *171,389 | *204,614 | *376,003 |

* Includes a small quantity of pig iron made with charcoal and electricity.

### TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Bituminous | 224 | 289 | 83 | 372 | 10,582,455 | 14,138,582 | 24,721,037 |
| Anth. & anth. & coke | 14 | 25 | 23 | 48 | 268,502 | 429,929 | 698,431 |
| Charcoal | 20 | 24 | 25 | 49 | 171,389 | 204,614 | 376,003 |
| Total | 258 | 338 | 131 | 469 | 11,022,346 | 14,773,125 | 25,795,471 |

## Miscellaneous Pig Iron Statistics.

### PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

| | Districts. | Blast Furnaces. In blast June 30, 1909. | Dec. 31, 1909. In. | Out. | Total. | Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1909. | Second half of 1909. | Total for 1909. |
|---|---|---|---|---|---|---|---|---|
| Pennsylvania. | Lehigh Valley | 13 | 17 | 9 | 26 | 310,058 | 380,430 | 690,488 |
| | Schuylkill " | 8 | 12 | 4 | 16 | 363,562 | 358,967 | 722,529 |
| | L. Susq. " | 8 | 14 | 5 | 19 | 251,939 | 358,032 | 609,971 |
| | Juniata " | 2 | 5 | 4 | 9 | 69,387 | 61,628 | 131,015 |
| | Allegheny Co. | 41 | 46 | 1 | 47 | 2,370,043 | 3,127,329 | 5,497,372 |
| | Shenan. Valley | 13 | 20 | 1 | 21 | 632,825 | 994,803 | 1,627,628 |
| | Miscel. bitum. | 16 | 17 | 2 | 19 | 756,403 | 880,727 | 1,637,130 |
| | Charcoal | 2 | 3 | 2 | 5 | 862 | 1,829 | 2,691 |
| Ohio. | Mahoning Val. | 17 | 20 | 2 | 22 | 977,596 | 1,301,054 | 2,278,650 |
| | Hocking " | 0 | 0 | 1 | 1 | | | |
| | Lake Counties | 10 | 14 | 1 | 15 | 605,357 | 959,846 | 1,565,203 |
| | Miscel. bitum. | 9 | 15 | 1 | 16 | 420,223 | 833,937 | 1,254,160 |
| | H. R. bitum. | 8 | 12 | 3 | 15 | 239,811 | 213,721 | 453,532 |
| | H. R. charcoal | 0 | 0 | 5 | 5 | 0 | 0 | 0 |

### PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

| | | | |
|---|---|---|---|
| New York | 285,882 | 342,544 | 628,426 |
| Pennsylvania | 1,640,469 | 2,211,137 | 3,851,606 |
| Maryland | 114,860 | 169,496 | 284,356 |
| West Virginia, Kentucky, and Tennessee | 102,677 | 191,160 | 293,837 |
| Ohio | 1,507,204 | 2,120,842 | 3,628,046 |
| Illinois | 799,748 | 1,004,654 | 1,804,402 |
| Michigan, Wisconsin, Colorado, and Cal. | 21,642 | 45,055 | 66,697 |
| Total | 4,472,482 | 6,084,888 | 10,557,370 |

### PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

| | | | | |
|---|---|---|---|---|
| Pennsylvania. | Lehigh Valley | 70,839 | 71,708 | 142,547 |
| | Schuylkill Valley | | | |
| | Lower Susquehanna Valley | 59,924 | 59,950 | 119,874 |
| | Allegheny County | 873,410 | 1,269,599 | 2,143,009 |
| | Shenango Valley | 636,296 | 809,880 | 1,446,176 |
| | Miscellaneous bituminous | | | |
| Ohio. | Mahoning Valley | 806,996 | 875,843 | 1,682,839 |
| | Lake Counties | 410,194 | 641,135 | 1,051,329 |
| | Hanging Rock bituminous | 290,014 | 603,864 | 893,878 |
| | Miscellaneous bituminous | | | |

### PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON

| | | | |
|---|---|---|---|
| New York and New Jersey | 76,411 | 390,508 | 466,919 |
| Pennsylvania—Allegheny County | 1,422,169 | 1,765,518 | 3,187,687 |
| Other counties | 817,880 | 1,250,678 | 2,068,558 |
| Virginia and Alabama | 181,603 | 221,300 | 402,903 |
| Ohio | 238,789 | 607,167 | 845,956 |
| Indiana, Illinois, Missouri, and Colorado | 560,729 | 717,473 | 1,278,202 |
| Total | 3,297,581 | 4,952,644 | 8,250,225 |

### PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

| | | | |
|---|---|---|---|
| Pennsylvania | 69,197 | 97,904 | 167,101 |
| Illinois | 22,378 | 35,561 | 57,939 |
| Total | 91,575 | 133,465 | 225,040 |

### PRODUCTION OF ALL KINDS OF PIG IRON FROM 1905 TO 1909.

| States—Gross tons. | Production—(Includes spiegeleisen, ferro-manganese, etc.) 1905. | 1906. | 1907. | 1908. | 1909. |
|---|---|---|---|---|---|
| Massachusetts | 15,987 | 20,239 | 19,119 | 13,794 | 18,388 |
| Connecticut | | | | | |
| New York | 1,198,068 | 1,552,659 | 1,659,752 | 1,019,495 | 1,733,675 |
| New Jersey | 311,039 | 379,390 | 373,189 | 225,372 | 294,474 |
| Pennsylvania | 10,579,127 | 11,247,869 | 11,348,549 | 6,987,191 | 10,918,824 |
| Maryland | 332,096 | 386,709 | 411,833 | 183,502 | 286,856 |
| Virginia | 510,210 | 483,525 | 478,771 | 320,458 | 391,134 |
| Georgia | 38,699 | 92,599 | 55,825 | 24,345 | 26,072 |
| Texas | | | | | |
| Alabama | 1,604,062 | 1,674,848 | 1,686,674 | 1,397,014 | 1,763,617 |
| West Virginia | 298,179 | 304,534 | 291,066 | 65,551 | 228,282 |
| Kentucky | 63,735 | 98,127 | 127,946 | 45,096 | 86,371 |
| Tennessee | 372,692 | 426,874 | 393,106 | 290,826 | 333,845 |
| Ohio | 4,586,110 | 5,327,133 | 5,250,667 | 2,861,325 | 5,551,545 |
| Illinois | 2,034,483 | 2,156,866 | 2,457,768 | 1,631,944 | 2,467,156 |
| Indiana | 288,704 | 369,456 | 436,507 | 348,096 | 964,289 |
| Michigan | | | | | |
| Wisconsin | 351,415 | 373,323 | 322,083 | 148,938 | 348,177 |
| Minnesota | | | | | |
| Missouri | | | | | |
| Colorado | 407,774 | 413,040 | 468,483 | 313,071 | 382,766 |
| Washington | | | | | |
| California | | | | | |
| Total | 22,992,380 | 25,307,191 | 25,781,361 | 15,936,018 | 25,795,471 |

# AMONG MACHINERY MAKERS.

## NEW YORK.

### Bethlehem Steel Co. Inquires for Large Order of Tools.

Office of THE IRON TRADE REVIEW, Room 1005, No. 90 West St., Feb. 1.

The feature of the week has been the circulation by the Bethlehem Steel Co. of a list covering its machine tool requirements in connection with improvements now under way or contemplated at the South Bethlehem plant. This list is estimated to call for fully $250,000 worth of machine tools, making it one of the largest to come before the trade since before the depression, and includes a number of gun lathes and other heavy machines. The matter is still in rather a preliminary state, but there is every likelihood that the inquiries will result in an early closing, as it is known that the Bethlehem works are assured of heavy business well into the future. The rail capacity is booked months ahead, the success of its special structural shapes continues, and the Argentine battleship order for armor plate and armor, practically assured, means activity in these departments for a considerable time, hence the matter of extending and improving the present works is being rushed.

The local machine tool trade reports business of the past week as quite satisfactory, scattered orders being sufficiently numerous to show a comfortable total. Some few price changes are developing, in line with the action of lathe manufacturers in December, but the advances involved are not important. Deliveries are unchanged and it appears that among the larger local dealers a good many machines on which the makers cannot promise shipment inside of several months are still available out of stock. The Baltimore & Ohio inquiry is still before the trade, no orders being reported, and in the west several smaller railroad lists remain unclosed. No other inquiries of importance have come out from this source.

The Otis Elevator Co. has made some good purchases during the week, buying for both its Buffalo and Yonkers plants. Included in the business closed were two cranes of good span.

Manufacturers of structural shop equipment are watching with interest the Bethlehem district, where it is reported on good authority that a fabricating plant with a capacity of perhaps 5,000 tons per month will be erected. Although it is known that the Bethlehem Steel Co. is not financially interested in the project, which is backed, according to reports, by Cincinnati interests, the general supposition is that the shop will be equipped to handle the special structural shapes turned out by this company.

The Lynchburg Foundry Co., Lynchburg, Va., has received the full amount of insurance carried on the buildings recently burned, $37,000, and will proceed at once with their replacement.

The Wilmington Malleable Iron Co., Wilmington, Del., has closed contracts for the construction of important additions to its works.

The continuation of activity on the part of railway equipment interests is evident in the several large car orders placed during the week and also in the statement of President Starbuck, of the New York Air Brake Co., to the effect that the unfilled orders on its books are now the largest in the history of the company. During the week orders were received for air brakes for 7,000 new cars and for 200 locomotives.

## PITTSBURG.

### Large Contracts are Held Up But Small Orders are Plentiful.

Office of THE IRON TRADE REVIEW, 510 Park Building, Feb. 1.

Pittsburg machinery manufacturers are pleased with the showing made during the opening month of the new year. While some of the larger contracts, which it is expected would be placed during the first half of the month have been held up indefinitely, the number of small orders received here is unusually large. The falling off in the awarding of big contracts, manufacturers claim, is partly due to the heavy buying some weeks ago and in some degree to the extreme cold weather. However, with the small contracts being placed and the orders now on the books the manufacturers are being kept fairly busy. New construction and extension work to be taken up as soon as weather conditions will permit insures steady operation by local makers for some time.

Despite the large volume of new business contracted for some time ago deliveries are fairly satisfactory. A few of the railroads are entering the market for machinery and tools. The Pittsburg & Lake Erie Railroad Co., Pittsburg, is receiving bids for some additional machinery to be installed in its Southside power station. Local machine companies are furnishing additional machinery for the Tennessee Coal, Iron & Railroad Co., Ensley, Ala., and are also bidding on some new tools for the Pennsylvania and Baltimore & Ohio railroads.

The Dravo Contracting Co., Pittsburg, has received a contract from the New River Collieries Co., Raleigh, W. Va., for sinking three shafts in the development of a large area of coal between Eccles and Harper, in Raleigh county. The shafts will be approximately 550 feet deep and will penetrate through both the Sewell and Beckley veins. Work will be started immediately.

The Union Spring & Mfg. Co., New Kensington, Pa., is building a $50,000 addition to its New Kensington plant in the shape of a new foundry. It is expected that the foundry will be in operation by the latter part of March.

Plans are being prepared by the Steel Car Forge Co., Elwood City, Pa., for a number of improvements to its plant, which will include the installation of new machinery of various kinds. Three new steam drop hammers will be installed in the machine shop, making a total of 11 steam drop hammers in the plant. Additional storehouses will be built, and the capacity of railroad sidings will be increased.

A charter has been granted to the Titlow Waste Heat Power Co., with offices and works at Uniontown, Pa. The capital stock of the new company is $150,000, and the incorporators are A. C. E. Lenhart, G. E. Titlow and Geo. H. Reynolds, of Uniontown, E. E. Morgan and F. V. Widgar, of Chicago. The company will manufacture and sell steam boilers, generators and other machinery for the utilization of waste heat from coke ovens. With the same incorporators, a charter was issued to the Morgan Coke Machinery Co., of Uniontown, with a capital stock of $300,000, to manufacture and sell machinery for drawing and loading coke and leveling and loading coal.

The West Penn Railway Co. is negotiating for the purchase of two 24-horsepower turbine engines to be installed at Green Junction, Pa., in connection with the enlargement of the company's present power house at that plant. This will double the capacity of the plant. It will require about

six months to build the engines, and it is expected that they will be ready for installation by next fall.

The Hiorra Coke Co., with an authorized stock of $200,000, has been chartered in West Virginia with offices at Uniontown, Pa., and will mine coal and manufacture coke in Preston county, W. Va. The incorporators are Wm. A. Stone, A. Plummer Austin, Wm. Hawkins, Geo. H. Bortz and Richard W. Austin, of Uniontown, Pa.

The Four States Coal & Coke Co., with a capital stock of $5,000,000, and the Annabelle Coal & Coke Co., capitalized at $100,000, have been chartered in West Virginia. Among the incorporators of the two companies are John H., David G., and Thos. P. Jones, E. F. Miller and Stephen Stone, of Pittsburg. Extensive construction plans are being considered, details of which will be made public following the election of officers in the near future.

With the additional men put on this week, the Westinghouse Electric & Mfg. Co., for the first time in three years, is now operating overtime practically all the departments of the East Pittsburg plant. The officials announce that the rush of orders is heavier than at any time in eight years. Several large orders have been booked recently and a fairly large amount of new business is in sight.

## CHICAGO.

### Past Month Proved to be Very Satisfactory.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Feb. 1.

The month of January was a very satisfactory one with makers and dealers in the machinery business. This is especially due to the fact that, business conditions in that month usually are not marked by much activity in buying, whereas, in the past month, the amount of selling compared very favorably with the heavy business of November and December. The buying on the part of automobile manufacturers which fell off for awhile, again is a factor which gives much satisfaction to machinery interests. Deliveries are improving somewhat, which also is looked upon very favorably by supply men and sales agents. Railroad buying constitutes a not inconsiderable proportion of the current business, and some of the lists which were announced some time ago, remain unclosed.

### List of Machinery Required by Great Northern Railway.

One wood trimmer for general work, similar to No. 8 Fox Universal.
One 26-inch pony planer, similar to No. 2½ Fay & Egan, with countershaft.
One vertical hollow chisel mortiser range, 1½-inch diameter and 6-inch deep.
One 28-inch drill press, sliding head, self-feed, automatic stop.
One 24-inch jointer, similar to Greenlee; countershaft.
One shaper with two heads and one Dodo head.
One 54-inch sand papering machine; countershaft.
One re-cut band saw; countershaft.
One knife grinder, similar to Fay & Egan No. 100.
One saw filer for circular and band saws; countershaft.
One pipe threading and cutting machine, to cut pipe 2½-inch to 8-inch; countershaft.
One No. 6 cut-off saw, iron traveling table; countershaft.
One 90-inch extra heavy driving wheel lathe; all modern attachments; motor.
One 90-inch quartering machine, R. & L.; stroke, 12-inch to 36-inch.
One 7-inch vertical boring machine; 30-inch under tool; motor.
One 400-ton wheel press, for wheels 80-inch diameter; double-acting pump; motor.
One 16-inch by 8-foot bed engine lathe, complete; countershaft.
One 18-inch by 8-foot bed engine lathe, complete; countershaft.
One 20-inch shaper, back geared, belt driven; countershaft.
One 20-inch slotter; 40-inch table; traverse, long., 48-inch; cross, 41-inch.
One radial drill, plain table for motor drive; motor furnished by buyer.
One 48-inch milling machine, 16-foot bed; motor.
One guide bar grinder; belt; countershaft.
One horizontal boring machine, No. 3N; belt; countershaft.
One No. 4 Universal high power milling machine; dividing head device, etc.
One 42-inch vertical milling machine, circular table, 42-inch diameter.
One 2-inch by 26-inch turret lathe for tool-room work; all modern improvements.
One Universal tool-grinding machine, No. 2; countershaft.
One twist drill grinder; ⅛-inch to 2¼-inch drills; at any range.
One 4-spindle drill press; spindle to have power speed friction release.
One steam hammer, single frame; capacity, 1,200 lbs.
One 200-lb. Beaudry hammer; belt.
One Newton cold metal saw; 36-inch diameter; motor.
One single end punch and shear; 48-inch throat; to punch 1-inch hole in ⅞-inch plate.
One two-head bolt cutter and threader; pump, countershaft, etc.; nine sets dies.
Two 3-inch by 36-inch J. and L. lathes; cross feed; single drive.
Two No. 3 W. & S. Universal turret lathes, with geared friction, etc.
One 16-inch by 8-inch tool-room lathe, complete.
One 20-inch drill press, sliding head, etc.
One 20-inch shaper, back geared; power feed to table.
One automatic rip and cut-off saw.
One bulldozer; movement of cross-head, about 20-inch.
One automatic car gaining machine, with hand-feed table, 2 feet long; countershaft.
One 20-inch by 10-foot bed engine lathe, complete; countershaft.
One 20-inch by 14-foot bed engine lathe, complete; countershaft.
One 30-inch by 12-foot bed engine lathe, complete, countershaft.
One 36-inch by 14-foot bed engine lathe, complete; countershaft.
Two 30-inch by 12-foot bed planers; two heads on cross rail; belt; countershaft.
One 30-inch by 15-foot bed planer; one head on cross rail; belt; countershaft.
One 42-inch by 12-foot bed planer; two heads on cross rail and one side head; motor.
One 20-inch vertical drill press, sliding head, complete; countershaft.
One 36-inch vertical drill press, sliding head, complete; countershaft.
One 48-inch double punch and shear; 36-inch and 48-inch throats; punch 1⅛-inch in ⅞-inch.
One standard multiple four-spindle drill machine.
One gap lathe, 20-inch and 44-inch by 16-foot bed; compound rest, taper attachment; countershaft.
One knife grinder, hand feed.
One Universal tool-grinding machine, No. 2; complete; countershaft.
Two 30-inch by 10-foot bed engine lathes, complete; countershaft.
Two 20-inch by 10-foot bed engine lathes, complete; countershaft.
Two 18-inch by 18-foot bed engine lathes, complete; countershaft.
One 30-inch drill press, sliding head, complete; back gear, etc.
One standard multiple four-spindle drill machine; each drill head ind. adjst. by rack and pinion or cross rail; drill spindles to have ind. drive and feed clutches, etc.; countershaft.
One horizontal punch, throat, 12-inch deep; punch, 1-inch in 1-inch plate.
One No. 3 hollow chisel mortiser and boring machine; ¼-inch to 3-inch by 6-inch deep; countershaft.
One No. 3 cut-off saw, iron traveling table.
One No. 3 circular rip saw, self-feeding iron table.
One 16-inch hand jointer, adjustable beveling fence; rising and lowering table.
One double-spindle shaping machine; spindles 26-inch apart; countershaft.
One three-spindle vertical car boring machine, power driven rolls; bore to 2-inch; countershaft.
One saw filer for circular and band saws; RH to grind saws up to 14-inch wide; countershaft.
One automatic car gaining machine; hand-feed table, 12-foot long.
One No. 5 Beaudry hammer; belt driven; 200 lbs.
One gap lathe, 20-inch by 44 inch by 16 foot bed, compound rest, taper attachment; countershaft.
One 28-inch drill press, sliding head, complete.
One 28-inch Morton draw-cut shaper.
One single head bolt cutter and threader; six sets of dies.
One 175-foot steam drive air compressor.
One 7-inch by 7-foot vertical engine, 200 revolutions per minute, self-contained, complete.
One Universal tool-grinding machine No. 3, similar to Cincinnati Milling Machine Co.
One 42-inch vertical milling machine, circular table, 42-inch diameter, complete; countershaft.
One 20-inch traversing head shaper; single head; power feeds; 6-foot 6-inch bed.
One Buckeye vertical cross compound condensing heavy duty engine.
One ATB type 72-pole, 630-kilowatt, 85 per cent factor, 100 revolutions per minute, 580-volt generator.
One surface condenser to contain 2,809 square feet cooling surface, similar to Wheeler Condenser & Engineering Co. rectangular surface condenser.
One cooling tower; capacity for 1,500 horsepower; to cool to 70 degrees Fahr.
One 18-inch Monitor brass lathe, 6-foot bed; belt driven; complete; countershaft.
One 16-inch Monitor brass lathe, 6-foot bed; belt driven; complete; countershaft.
Two W. & Swasey No. 3 Universal turret lathes.
Two 40-inch upright drill presses, with power self-feed automatic stop; belt; countershaft.
One No. 4 Universal high power milling machine, complete; countershaft.
One No. 24 shaper, back gear, power to feed to table; complete; belt; countershaft.
Three 16-inch engine lathes, 8-foot bed, with complete regular equipment; countershaft.
Three 51-inch boring and turning mills, to take 36-inch under tool holder.
One 51-inch boring and turning mills, to take 36-inch under tool holder.
One extra heavy locomotive rod boring machine; distance between spindles 13-foot 4-inch; to bore up to 20-inch diameter and 20-inch deep.
One No. 3 Bickford full Universal radial drill; motor furnished by buyer.
Two standard multiple four-spindle drill machines.
Two 50-inch drill presses (upright), sliding head; complete; power self feed; countershaft.
One 48-inch horizontal slab milling machine, 10-foot bed; motor.
One 8-inch horizontal slab milling machine, 16-foot bed; motor.
One die-sinking machine; 12½-inch center of spindle to base of column; belt.
One 36-inch double head and traversing shaping machine; 11-foot bed; complete; countershaft.
One 26-inch Morton draw-cut shaper, reversible quick change automatic feed.

One 36-inch engine lathe, 10-foot bed; complete.
One 24-inch engine lathe, 10-foot bed; complete.
One 30-inch engine lathe, 10-foot bed; complete.
One 6¼-inch Gisholt lathe for bar work; belt; complete.
Two 24-inch standard turret lathes, complete for chuck work; countershaft.
Four 3-inch by 36-inch J. & L. gap turret lathes, cross feed, single drive; complete; countershaft.
One Newton cold metal saw; saw to be 36-inch in diameter; similar to No. 4.
One power hack metal saw; capacity 7-inch by 8-inch; stroke of saw blade 6-inch.
One horizontal boring and drilling machine; table, 48-inch by 36-inch.
Three 8 by 24 J. & L. flat turret lathes, cross feed, single drive; belt; countershaft.
One 22-inch slotter; table, 40-inch diameter; long. traverse, 48-inch; cross, 41-inch; motor.
One 12-inch slotter; table, 24-inch diameter; long. traverse, 18-inch; cross, 18-inch; countershaft.
One Universal tool-grinding machine No. 2, similar to Cincinnati Milling Machine Co.
One traveling head planer for planing locomotive cylinders.
One vertical key-seating machine for shafts up to 12-inch diameter; complete; countershaft.
One centering machine No. 1, similar to Niles, Bement, Pond.
One 24-inch drill press, sliding head, complete; back gear, self feed, automatic stop.
One 18-inch drill press, as above.
One No. 3 Swartz converter for brass used with crude oil.
One 1-inch bolt header, continuous motion, made by Ajax Mfg. Co.; complete; belt.
One 3-inch forging machine, made by Ajax Mfg. Co.; complete; motor.
One 1½-inch forging machine (Ajax); intermitting motion; belt; complete; countershaft.
Two 200-lb. Beaudry steam hammers; belt; countershaft.
One two-spindle drill press; spindle to have power speed friction release; etc.
One double punch and shear; 36-inch and 48-inch throats; to punch ⅛-inch in ⅞-inch; motor.

## CINCINNATI.

### Trade Is Quiet Among Builders of Machine Tools.

Office of THE IRON TRADE REVIEW,
N. E. cor. Fourth and Elm Sts., Feb. 1.

Machine tool builders in this city report trade more quiet during the past week, inquiries less frequent, and orders slightly behind the previous record. The exception, perhaps is the continued demand for milling machines, upright drills, and the smaller size of lathes, which are still in the forefront and most active. Planers and radials have also picked up to some extent and are said to show a little more life. Builders of wood working machinery note no signs of improvement in demand for this particular class of tools, and order books are not being filled in a very satisfactory manner. It appears to be the general feeling among manufacturers, that the continued absence of any considerable volume of business from the east is in a measure responsible for the temporary lull, whether occasioned by the annual inventories or other causes, is practically indeterminable. Local foundries are not very busy, and show a slight decline below last report.

The school for apprentices shows a healthy development, and the boys are keenly interested in the work of tracing the ore as taken from the mines, to the finished machine, ready for shipment. Manufacturers are also greatly pleased with the results thus far obtained, and although the undertaking is shown to be rather expensive, it enables the manufacturer to discover individual talent, that otherwise might never come to the surface. One of the rooms of the Woodward high school is to be equipped with 36 complete forges, as an adjunct to this training.

The Lodge & Shipley Machine Tool Co. reports a slight falling off in orders during the past week or two. The general run of business, however, is fairly satisfactory, and shops are working full time.

The Cincinnati Shaper Co., in its gear cutting department especially, is disposing of its product to the various automobile interests throughout the country. The company expects renewed interest along all lines before many weeks.

The Champion Tool Works has recently installed several new tools and reports trade coming forward in a fairly satisfactory volume.

The John Steptoe Shaper Co. is receiving a fair sprinkling of orders for the smaller class of tools of its manufacture. Foreign trade is said to be at low ebb and shows no signs of any improvement. A new gas furnace for forging and tempering tools is now being installed, that will very materially add to the present shop equipment.

The Mueller Machine Co., manufacturer of radials from 2½ to 4½ inches, recently secured an order for twelve of their tools from a large manufacturer of automobiles. Trade is said to be a little better, but not up to expectations.

Greaves-Klusman & Co. are fairly busy in their engine lathe department. They think however the outlook is good for renewed trade during the next few months.

## MILWAUKEE.

### More Additions to Manufactories—Site for School of Trades.

Milwaukee, Wis., Jan. 31.—Indications are that not only the machinery manufacturing plants of Milwaukee are meeting with prosperity enough to enlarge their plants and increase their output. Several of the well-known machinery concerns about the state are erecting new additions at this time and increasing their facilities in various ways.

The Fuller & Johnson Mfg. Co. and the Gisholt Machine Co., operating the two largest industrial plants at Madison, are in the midst of a period of expansion. Completed or under construction are a large two-story, fireproof office building for the Fuller & Johnson company, and an addition to the gas engine department for the manufacture of farm pump engines; an enlargement of the Gisholt company's powerhouse to accommodate a new 500-horsepower Corliss engine, an addition to the Gisholt foundry to double its present size, and extensive improvements in methods and equipment. It is also announced that preliminary steps have been taken for erecting an addition to the machine shops of the Gisholt plant. Considerable new equipment is being installed in the Fuller & Johnson company's plant in order to meet the steadily increasing orders for farm machinery that the company is securing. The foundry of the Gisholt company is now one of the most modern in Wisconsin.

Property bounded by Greenbush, Hanover and Virginia streets, Milwaukee, is recommended for condemnation by the city as a site for the erection of a new building for the Milwaukee school of trades, to take the place of the structure destroyed by fire some time ago. The school board committee in charge of the matter has offered the Pawling & Harnischfeger company, well-known Milwaukee machinery manufacturers, $100 a month rent for the building now occupied temporarily by the school.

Heyl & Paterson, of Pittsburg, have been awarded the contract for erecting a concrete mixing plant on the Minnesota Steel Co.'s property on the St. Louis river, near Superior, Wis. The concrete plant, which will cost in the neighborhood of $100,000, will be used in the construction of the foundations of the blast furnaces and buildings which will be erected by the Minnesota Steel Co. in the spring.

Orders for all sorts of producing machinery are being received by the Allis-Chalmers Co., Milwaukee, at a greater rate than has been the case for several months. A few of the recent orders include Mershon-Bacon Co., Bay City, Mich., electrical machinery; Sapulpa Steel & Iron Mills, Sapulpa, Okla., heavy-duty rolling mill engine; Passaic Cotton Mills, Passaic, N. Y., engines and electrical equipment; Fuld & Hatch Knitting Co.,

Cohoes, N. Y., steam turbo generator; Maverick Mills, East Boston, Mass., electrical machinery; Virginia Electrical Power & Water Co., Virginia, Minn., additional power apparatus; Portland Railway, Light & Power Co., Portland, Ore., hydro-electric machinery; Armstrong Cork Co., Camden, N. J., gas engine generator units; Edward E. Rieck Co., Pittsburg, Pa., gas engine and electrical equipment; Jones & Laughlin Steel Co., Pittsburg, Pa., new mill engine.

## BUFFALO.

### Numerous Inquiries Give Evidence of Better Prospects.

Office of THE IRON TRADE REVIEW,
932 Ellicott Square, Feb. 1.

Machinery manufacturers have taken a very optimistic view of the general situation here. Inquiries received by them this month from prospective buyers apparently justifies their opinion. The feeling of encouragement is strengthened by the statement of the Allis-Chalmers Co. that the Buffalo office has now under consideration in one form or another business aggregating $250,000. There has certainly been a decided increase in the number of inquiries since the beginning of the year. Nearly all interests report the month of January as satisfactory and look for good business for some time to come.

The King Sewing Machine Co., which will equip a large independent factory for the manufacture of sewing machines at this point, will probably not begin building for several months, owing to the time which will be needed in straightening out some matters with the city pertaining to the site which has been purchased.

The Buffalo Foundry & Machine Co., which will increase its plant here by the addition of a large machine shop, has let the contract for fabricating the steel and erecting the shop to the Lackawanna Bridge Co., of Buffalo. The building will require 375 tons of steel and will be completed April 1. Foundations have been laid and construction will begin in a few days.

The Allis-Chalmers Co. booked a number of orders recently, including one from the Taggart Bros. Co., paper mills, Watertown, N. Y., for one 175-kilowatt generator direct connected to Reynolds-Corliss engine. The contract includes ten motors, generator set and switchboard. The same company reports an order from the Utica Fine Yarn Co., a new factory, for one 750-kilowatt steam turbine and equipment.

The Buffalo, Rochester & Pittsburg railroad has placed an order with the Allis-Chalmers Co. for a tie-treating plant to be constructed at Bradford, Pa. The Pennsylvania railroad has a similar plant in operation which was built by the same company.

The Niagara Falls Hydraulic Power & Mfg. Co., which is increasing its power facilities, has planned to install eight additional 10,000-horsepower alternators. Two were installed recently and an order for duplicating these has been given to the Allis-Chalmers Co., of Milwaukee. Orders for six more are to be placed which will give the company a total of ten machines.

It is becoming more evident that the New York Central railroad contemplates building a large passenger terminal at Buffalo in the near future. No definite announcement has been made as to when this will be done.

## YEAR'S EARNINGS

### Of United States Steel Corporation, With Comparisons.

With the report of the United States Steel Corporation's figures for the quarter ending Dec. 31 last, comparison of the figures for the entire year just passed becomes available, although as stated in the report, changes may be made because of corrected figures in the annual report to be made later. The surplus balance for the quarter just ended was $4,251,130; for the previous nine months, $11,076,031; or for the entire year 1909 of $15,327,161. This compares with $10,497,934 for 1908. The following is a comparative statement of net earnings by months and quarters:

| | 1909. | 1908. | 1907. |
|---|---|---|---|
| October | $14,048,205 | $ 9,415,668 | $ 17 052,211 |
| November | 13 711,765 | 8,756,729 | 10.467,253 |
| December | 13,211,339 | 8,053,088 | 5,034,531 |
| 4th quarter. | $40 971,309 | $26,225,485 | $ 32,553,995 |
| January | 7,262.605 | 5,052.743 | 12,838.703 |
| February | 7,669,336 | 5,709 428 | 12,145 815 |
| March | 7,989.327 | 7,466,834 | 14,137,974 |
| 1st quarter. | $22,921,268 | $18,229,005 | $ 39,122,492 |
| April | 8.163,244 | 6,761.680 | 14.600,838 |
| May | 9,661,228 | 6,021.279 | 16.056 832 |
| June | 11,516,019 | 7,482.797 | 14,846,035 |
| 2d quarter. | $29,340,491 | $20,265,756 | $ 45,503,705 |
| July | 12.530 770 | 8,599,630 | 13.804.167 |
| August | 12,437,754 | 9.152.311 | 15,279.173 |
| September | 13,278,383 | 9,354,333 | 14.720,945 |
| 3d quarter. | $38.246.907 | $27,106,274 | $ 43,804 285 |
| Year | $131,479,975 | $91,826,520 | $160,984,477 |

The following comparative statement of income for the quarter ending Dec. 31 is made:

| | 1909. | 1908. |
|---|---|---|
| Net earnings | $40,971,309 | $26,225,485 |
| Sinking fund subsidiary companies | $ 438,914 | $ 248 272 |
| Depreciation and reserve | 6,131,963 | 4,965,550 |
| Total | $ 6,570,877 | $ 5,213,822 |
| Balance | 34,400,432 | 21,011,663 |
| Interest on bonds | 5,880,324 | 5,942 354 |
| Sinking fund U. S. bonds | 1,431,639 | 1,369,609 |
| Total | $ 7,311,963 | $ 7,311,963 |
| Balance | 27,088,469 | 13,699,700 |
| Sundry appropriations | 562,874 | 289,183 |
| Available for dividends | 27,651 343 | 13,988,883 |
| Preferred dividend | 6,304,919 | 6,304,919 |
| Balance for common | 21,346,424 | 7 683,964 |
| Common dividend | 8,895,294 | 2,541,513 |
| Balance | 12,451,130 | 5,142,451 |
| Appropriations new construction | 5,000.000 | ..... |
| Reserve fund, mining royalty | 3,200,000 | ..... |
| Total special appropriations | $ 8,200,000 | ..... |
| Surplus | 4,251,130 | 5,142,451 |
| Surplus previous nine months | 11,076,031 | 5,355,483 |
| Total surplus | $15,327,161 | $10,497,934 |

The totals for the year ending with the statement of the last quarter compare:

| | 1909. | 1908. |
|---|---|---|
| Net earnings | $131,479,975 | $ 91,826,520 |
| All interest, etc | 52,963,911 | 46,232,041 |
| Balance for dividends | 78,516,064 | 45,594,479 |
| Dividend preferred | 25,219,676 | 25.219 677 |
| Balance for common | 53,296,388 | 20,374,802 |
| Common dividend | 20,332,101 | 10 166,050 |
| Surplus | 32.964,287 | 10,208,752 |
| Special funds, etc | 18,200,000 | ..... |
| Surplus | 14,764,287 | 10,208,751 |
| Net administration— | | |
| Sundry accounts | 562,874 | 289,183 |
| Final surplus | 15,327,161 | 10,497,934 |
| Previous surplus adjustment | 133,415,214 | 122,645,244 |
| Total surplus | $148,742,375 | $133,143,178 |

The unfilled orders of the various quarters, with comparisons, follow:

| | Tons. 1909. | Tons. 1908. | Tons. 1907. |
|---|---|---|---|
| December 31 | 5,927,031 | 3,603,527 | 4,624,553 |
| September 30 | 4.796,833 | 3,421,977 | 6,425,000 |
| June 30 | 4,057,939 | 3,313,876 | 7,603,878 |
| March 31 | 3,542,595 | 3,765,343 | 8,043,058 |

## WILL INSTALL GIROD FURNACE.

C. W. Leavitt & Co., 30 Church street, New York City, announces that one of the largest steel works in Germany and two prominent American works, whose names cannot be disclosed at this time, have decided to install the Girod electric furnace. Many engineers who have seen the Girod furnace in operation have been favorably impressed, and negotiations are now pending with other large works in this country for the installation of this furnace on a large scale.

## FOR DOUBLE TRACK WORK.

Announcement is made that contracts will be let shortly by the Norfolk & Western railway for double track work and other improvements on its Columbus division, involving an expenditure of about $2,000,000.

# EFFECT OF TWISTING ON IRON AND STEEL BARS

**Remarkable Increase in Tensile Strength and Elastic Limit.**

A number of interesting tests showing the physical characteristics of steel and iron bars when subjected to repeated twisting and untwisting have recently been made by Smith, Emery & Co., testing engineers, San Francisco, for Dunham, Carrigan & Hayden Co., San Francisco. It was found that after undergoing five operations of twisting and untwisting the steel bars showed a gain in tensile strength of 53.1 per cent and elastic limit of 108.2 per cent.

It has been known for some years that when a square bar of iron or soft steel is twisted cold, the tensile strength and elastic limit are materially increased at the expense, however, of ductility. In 1888 Ernest L. Ransome of San Francisco obtained an English patent for improving the strength of wrought metal and steel bars or rods by twisting in a cold state. Ransome's patent claims that not only is the tensile strength and elastic limit increased but latent defects in the structure of the bar itself brought to the surface. Experiments made in connection with this patent show that the tensile strength of iron bars twisted 3¼ turns per foot was increased from 54,180 pounds per square inch to 65,000 pounds per square inch, or 20 per cent. Tests corroborating these results were made by the University of California in 1889 and by the Low Moor Iron Works, England, in 1890.

The tests recently made in San Francisco for Dunham, Carrigan & Hayden Co. were carried much further than any of the foregoing experiments and show that the tensile strength and elastic limit of soft steel bars continues to increase after repeated twisting and untwisting in a cold state even up to the point of fracture.

The tests were made on both iron and steel bars taken from stock and the following data are supplied by Smith, Emery & Co. The steel bars were open-hearth products and the several test pieces were all cut from the same bar. The iron bars were made by rerolling scrap, piled and heated in an oil-fired melting furnace. Fig. 1 illustrates the results of the tests on steel bars and Fig. 2 of the tests on iron bars. *A*, Fig. 1, shows a 7/16-inch plain square steel bar before twisting, the tensile strength being 62,600 pounds per square inch, the elastic limit 43,800 pounds, the elongation 26.00 per cent and the reduction of area 65.50 per cent. *B* shows the same bar twisted the first time. In this condition the physical characteristics were as follows: Tensile strength, 89,000 pounds per square inch; elastic limit 78,000 pounds per square inch, elongation 4.75 per cent and reduction of area 30.60 per cent. *C* shows the bar untwisted and straightened. After straightening the bar showed no evil effects from the punishment it had received; the tensile strength was 86,000 pounds per square inch, the elastic limit 76,000 pounds, the elongation 8.25 per cent and the reduction of area 57.10 per cent. Again the bar was twisted in an opposite direction as shown at *D*. In this condition, after having been twisted, untwisted, straightened and again twisted in the opposite direction the tensile strength rose to 92,800 pounds per square inch, the elastic limit to 83,500 pounds, the elongation was 6.62 per cent and the reduction in area 21.90 per cent. The bar was now untwisted and straightened as much as possible, assuming the condition shown at *E*. This piece tested 94,000 pounds per square inch tensile strength, 87,600 pounds elastic limit, 6.00 per cent elongation and 51.30 reduction in area. Finally the bar was twisted a third time in the same direction as the first twist. This final piece *F*, was subjected to five operations namely, twisting, untwisting, twisting in opposite direction, untwisting and twisting again in the same direction as at first. In this piece the tensile strength was found

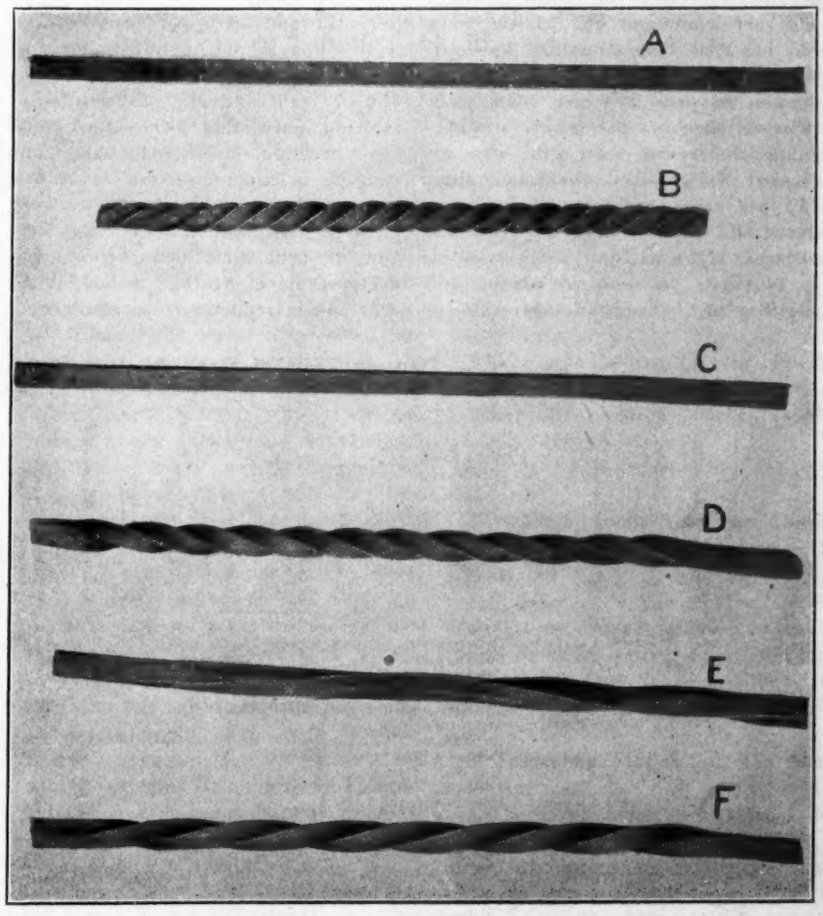


FIG. 1—STEEL BARS.

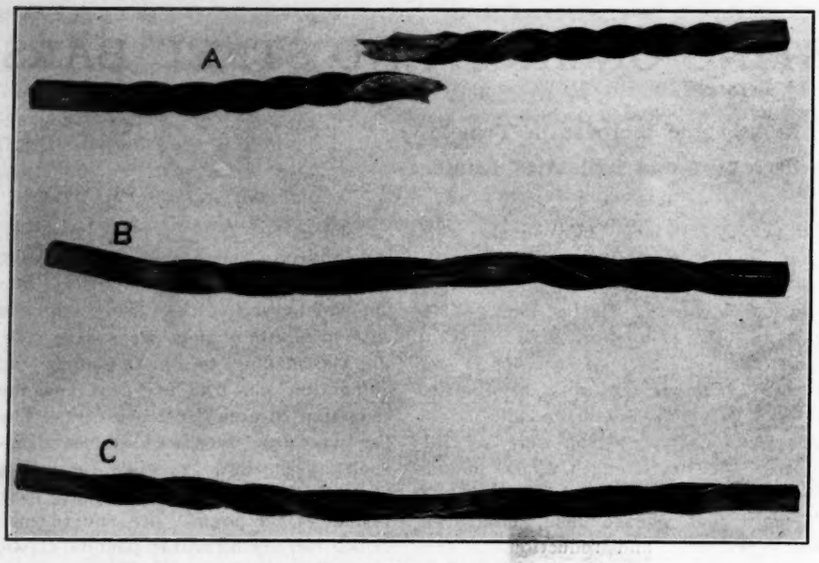


FIG. 2—IRON BARS.

to be 95,800 pounds per square inch, the elastic limit 91,200 pounds, the elongation 7.00 per cent and the reduction of area 51.50 per cent.

Taking the characteristics of the untreated steel bar as a basis the effect of the operations is seen to be as follows: Twisting once to 14 twists per foot increased the tensile strength 42.3 per cent and the elastic limit 78.0 per cent, the elongation, however, was reduced 82 per cent and the reduction of area 53.4 per cent; after twisting, then untwisting and straightening the tensile strength was increased 37.3 per cent, the elastic limit 73.5 per cent, the elongation was reduced 68.2 per cent and the reduction of area 12.8 per cent; after twisting to 14 twists per foot, untwisting and twisting in the opposite direction to 10 twists per foot the tensile strength was increased 48.3 per cent, the elastic limit was raised 90.5 per cent, the elongation was reduced 74.5 per cent and the reduction of area 66.5 per cent; after twisting, untwisting, twisting in the opposite direction and finally untwisting, the tensile strength and the elastic limit increased 50.0 per cent and 100.0 per cent respectively while the elongation and reduction of area decreased respectively 77.0 per cent and 21.7 per cent; after twisting, untwisting, twisting in opposite direction, untwisting again and twisting in same direction as at first to seven twists per foot, the increase in tensile strength was 53.1 per cent and in elastic limit 108.2 per cent, the decrease in elongation was 73.1 per cent and in reduction of area, 21.4 per cent. After the final twist the steel bars showed no signs of disintegration.

The common iron bars tested in the untwisted state showed a tensile strength of 61,600 pounds per square inch and an elastic limit of 40,400 pounds.

Fig. 2 shows the effects of the twisting on the iron bars. Piece *A* broke on untwisting after being twisted to 12 turns per foot; piece *B* began to disintegrate upon untwisting and the same effect was noted in piece *C*, which was Norway iron with a tensile strength of 65,800 pounds and an elastic limit of 51,200 pounds. On account of the breakage and disintegration of the specimens the experimenters were unable to determine the effect of repeated twisting and untwisting on the iron bars.

Detailed results of the experiments are given in the accompanying table and the chart on the following page.

## NEW CATALOG OF THE WORCESTER POLYTECHNIC INSTITUTE.

The fortieth annual catalog of the Worcester Polytechnic Institute has just been issued. It is a book of 253 pages, some thirteen more than that of last year, and contains full information as to the Faculty of the Institute, the courses offered, the list of students in attendance this year, the names and occupations of the graduates and much other information of interest to the friends of the Institute and of technical education.

The Board of Trustees shows no change from last year, but the Faculty list contains one new name of a professor, that of E. L. Hancock, Pro-

**Twisting Tests of Steel and Iron Bars.**

| Kind of material. | Nominal dimensions. Inch. | Actual dimensions. | Condition of bar. | Twists per foot length. | Tensile strength. Pounds per square inch. | Elastic limit. | Elongation in 8 inches. | Per cent elongation. | Reduction area per cent. | Per cent increase of tensile strength. | Per cent increase of elastic limit. | Per cent decrease in elongation. | Per cent decrease in reduction of area. | Nature of fracture. | Remarks. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Steel..... | 7/16 x 7/16 | 0.430 x 0.432 | Plain..... | 0 | 62,600 | 43,800 | 2.08 | 26.00 | 65.50 | 0.0 | 0.0 | 0.0 | 0.0 | Cupped, silky | |
| Steel..... | 7/16 x 7/16 | 0.430 x 0.432 | Twisted once..... | 14 | 89,000 | 78,000 | 0.38 | 4.75 | 30.60 | 42.30 | 78.00 | 82.00 | 53.40 | Irregular | |
| Steel..... | 7/16 x 7/16 | 0.429 x 0.430 | Twisted and untwisted..... | 0 | 86,000 | 76,000 | 0.66 | 8.25 | 57.10 | 37.30 | 73.50 | 68.20 | 12.80 | Cupped, silky | |
| Steel..... | 7/16 x 7/16 | 0.434 x 0.431 | Twisted, untwisted, twisted opposite... | 10 | 92,800 | 83,500 | 0.53 | 6.62 | 21.90 | 48.30 | 90.50 | 74.50 | 66.50 | Irregular | |
| Steel..... | 7/16 x 7/16 | 0.428 x 0.431 | After untwisting second time..... | 0 | 94,000 | 87,600 | 0.48 | 6.00 | 51.30 | 50.00 | 100.00 | 77.00 | 21.70 | Irregular | |
| Steel..... | 7/16 x 7/16 | 0.430 x 0.433 | Twisted a third time | 7 | 95,800 | 91,200 | 0.56 | 7.00 | 51.50 | 53.7 | 108.20 | 73.10 | 21.40 | Cupped, silky | |
| Common iron.... | 1/2 x 1/2 | 0.491 x 0.486 | Twisted and untwisted..... | 12 | 61,600 | 40,400 | .... | ..... | ..... | | | | | Irregular | Broke in untwisting. |
| Common iron.... | 1/2 x 1/2 | 0.485 x 0.490 | Twisted and untwisted..... | 10 | 50,500 | 39,000 | 0.12 | 1.50 | ..... | | | | | Irregular spread | Disintegrated on untwisting |
| Norway iron.... | 7/16 x 7/16 | 0.430 x 0.435 | Twisted and untwisted..... | | 65,800 | 51,200 | 0.38 | 4.75 | 24.30 | | | | | Irregular | Disintegrated on untwisting |

fessor of Applied Mechanics, and four names of instructors who have received promotion to assistant professorships, after service as instructors. These are D. L. Gallup, Assistant Professor of Gas Engineering; C. D. Knight, Assistant Professor of Experimental Electrical Engineering; F. Bennet Jr., Assistant Professor of Chemistry; and R. C. Sweetser, Assistant Professor of Analytical Chemistry. The Faculty of the Institute now numbers twenty-four, including Prof. J. E. Sinclair, who retired in June, 1908, on the Carnegie Foundation, but whose name still stands on the list of professors. There are besides twenty-six instructors, including several who are now in their first year of service at the Institute.

The catalog shows the requirements for admission to be the same as last year, but the added requirements as fixed by the Faculty in 1907 are still in force, and there seems no necessity for raising them any higher, at least for the present. An interesting feature of the catalog in this connection is the list of accredited schools from which students are admitted on certificate without examination. This list contains over 150 public and private schools located in all parts of the country though the majority are in the east.

The subjects of instruction offered in the Institute are discussed in full and in this catalog for the first time are mentioned the studies that are prerequisite to taking the various subjects that form the different courses. Besides the undergraduate courses there are others provided leading to the graduate degrees of Master of Science and Doctor of Science in mechanical, civil and electrical engineering and in chemistry, and to the prefessional degree of mechanical, civil, chemical and electrical engineering.

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At the recent annual meeting of the International Steel Tie Co., Altoona, Pa., encouraging reports were heard from First Vice President and General Manager W. P. Day, and the decision was arrived at to sell $50,000 worth of stock for the purpose of building. The assembly plant at Johnstown, Pa., is under way, covering half an acre. For the present the fasteners will be manufactured at Cleveland. These officers and directors were elected: President, V. A. Oswald; secretary, George Harpham; treasurer, S. M. Hoyer; manager, W. P. Day; J. R. Brockel, John P. O'Donnell and P. H. Lavin, the latter of Cleveland.

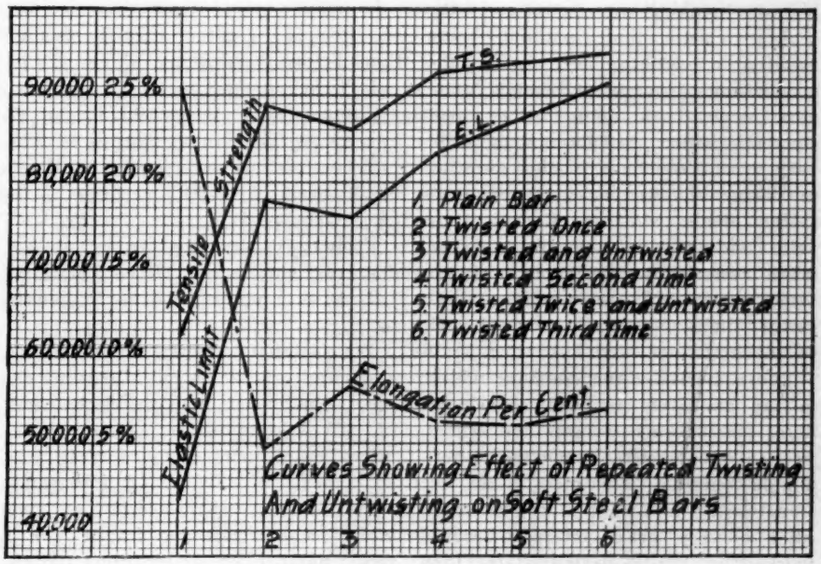



FIG. 3—GRAPHIC CHART OF RESULTS OF EXPERIMENTS.

# SPECIAL STEELS.[1]

BY LEON GUILLET.[2]

Since the last congress, held at Brussels, the manufacture of special steels has made interesting progress and has taken a perfectly definite course which it may be instructive to indicate.

It is the actual tendencies which we wish to discuss briefly.

We may remark at the outset that, if we class steels according to their structure, as we have done in the memoir presented to the last congress, we see that at present perlitic steels (those which display the same structure as ordinary carbon steels) are almost the only ones which are used as materials of construction.

It is certain in fact, that the polyhedric steels (gamma iron steels containing much nickel and manganese) are losing every day in commercial importance, on account both of their high price and their low elastic limit. They are indeed hardly applied except in very particular cases, when their high resistance to oxidation, their capability of withstanding the temperatures of superheated steam, or finally the expansion coefficients characteristic of some of them are to be utilized. But their application in mechanical construction, on which certain metallurgists placed great hopes, has not become general.

The Hadfield steel always finds interesting appreciation in cases where high resistance to shocks and to wear must be allied.

Disregarding tool steels and steels for balls and ball bearings of carbide structure we only find one industrial kind of steel now, the perlitic steels.

Let us inquire into the actual tendencies in the manufacture of these products.

The special perlitic steels, approximately arranged as to their importance, are:

The nickel steels and the nickel-chrome steels.

The vanadium steels, with or without nickel and chromium.

The silicon steels (often called mangano-silicon steels).

Finally, more rarely, the tungsten steels.

Whichever steels may be considered, the actual tendencies are the following:

1. Raising the mechanical strengths, such as we are accustomed to define them; in this respect the introduction of vanadium is especially to be mentioned, but it is little utilized in Europe.

2. The simplification of the thermal treatment.

3. The creation of special types for parts exposed to friction.

In attempting to raise the mechanical strength, that is to say, to produce steels characterized by the

[1]Presented at Fifth Congress of International Association for Testing Materials. Translated from the French by Dr. H. Borns, London.

[2]Paris.

highest breaking strength and the highest elastic limit without being too fragile, we have been led to the production of more and more complex steels, containing often three elements which are foreign to ordinary steel. We have in this question to distinguish two important points:

The steels which give interesting values, when rough forged or better when annealed, suffer from a grave disadvantage; if they possess high elastic limits, they are very difficult to machine.

Those steels on the contrary which, in the annealed condition, have medium mechanical strength and which, by an appropriate, sometimes very simple thermal treatment, can be transformed into high-strength steels, offer a very great interest because worked in the annealed state, they do not require more than a tempering after the treatment.

Let us look at the extreme values which we can obtain.

Some time ago I described a nickel-silicon steel which gave extraordinary values. The composition was:

C = 0.221, Ni = 12.00, Si = 1.78, Mn = 0.112, S = 0.011, P = 0.005.

Annealed at 900 degrees Cent., it yielded the following figures:[1] R = 170.0, E = 141.1, A per cent = 9, Σ = 42.9, impact = 5.

After hardening at 825 degrees Cent. in water of 20 degrees Cent.: R = 202.8, E = 138.3, A per cent = 4, Σ = 0, impact = 10.

But this steel is as such martensitic, very difficult to work without treatment. We do not believe that it has any industrial future.

There are some other industrial types belonging to the category of steels which, in their normal conditions, are easy to manage and which, by suitable treatment, acquire noteworthy properties.

1. Nickel-vanadium steels.

Composition: C = 200, Ni = 7, V = 0.2, Mn = 0.30.

Properties when annealed: R = 65, E = 45, A = 20 per cent.

Properties after hardening at 850 degrees Cent. in water: R = 140, E = 120, A = 10 per cent.

2. Nickel-chrome-vanadium steels.

Composition: C = 0.450, Ni = 2.25, Cr = 0.60, V = 0.07, Mn = 0.28.

Properties when annealed: R = 70, E = 50, A = 20 per cent, impact = 6.

Properties after hardening at 800 degrees Cent. and tempering at 400 degrees Cent.: R = 150, E = 130, A = 6 per cent, impact = 11.

[1] R = strength; E = elastic limit; A = elongation; Σ = elongation + contraction.

It will be noted that the resistance to shock is greater after hardening than before hardening.

3. Nickel-chrome steels.

Composition: C = 0.173, Ni = 5.47, Cr = 0.18, Mn = 0.55, Si = 0.16.

Properties when annealed: R = 61, E = 36, A = 21.5 per cent, Σ = 55, impact = 12.

Properties after hardening at 850 degrees Cent. in oil: R = 130, E = 122, A = 5 per cent, Σ = 15, impact = 11.

We see that we may safely rely on a strength of 140 or 150 kilograms per square millimeter and an elastic limit of 120 kilograms per square millimeter, accompanied by a resistance to shocks of 10 or 12 kilograms; these figures characterize a steel which would not be fragile for a large number of applications (shafting, gearing).

There is one tendency which has become extraordinarily general during the last months; it is the introduction of vanadium into steels.

We have dwelt in several communications on the important part played by vanadium; this element augments the properties which we produce by quenching to a very considerable degree.

0.2 or 0.3 per cent of vanadium suffice to raise the breaking strength and the elastic limit after quenching considerably, without sensibly modifying the properties of the annealed metal. Chromium and silicon act in the same sense; but they also introduce fragility and they modify the properties of the annealed metal much more than vanadium does.

It should also be pointed out that vanadium has received much more attention in England and particularly in America than in France. Very satisfactory results have been realized in the production of armor plates, springs, matrices, etc., and vanadium steels are quite an industrial product.

The second point aimed at in the improvement of the manufacture of special steels concerns the simplification of the thermal treatment. This is a most important feature. Most works are not equipped for a precise treatment which comprises quenching at a definite temperature and tempering at some precise temperature, considering that the latter process has to be carried out as a rule at low temperatures ranging from 200 to 400 degrees, and that a variation of 25 degrees will often materially alter the properties, especially as regards friction.

Metallurgists have therefore had every reason to simplify the thermal treatment which is to impart certain qualities to the steel.

The first step taken in this direction has been the suppression of the tempering process.

With this object in view attempts have been made to vary the composition of the steel in such a manner that the brittleness after quenching—desirable for some applications — should not require subsequent diminution by some tempering process.

The nickel-vanadium steel of which we have already spoken is a notable example in point. It is quenched in water, and we need not much trouble about the exact temperature of the water.

With the same object have been produced steels containing slight percentages of nickel-manganese and silicon, but rather rich in carbon; these steels need a simple quenching in oil, at 800 or 900 degrees (C = 0.45, Ni = 1.25, Mn = 1.14, Si = 1.28).

It is, however, quite obvious that, of all treatments, ordinary air cooling is undoubtedly the simplest. Leaving the rapid tool steels, with which we do not wish to deal in this note, out of the question, air quenching is applied to a certain number of nickel steels, and we can predict which steels will lend themselves to this air quenching. We know that nickel steels are either perlitic, or martensitic, or polyhedric. We likewise know that the martensite structure is the structure of ordinary well quenched steels, and that the transition of one structure into the other depends upon the sum of (Ci + Ni) and upon the other elements as well; manganese and chromium in particular exert an influence of the same character as nickel.

The change from one structure to another is moreover not sudden.

There are steels which contain both perlite and martensite; it will be sufficient to apply air cooling to render the structure all martensitic.

It is, therefore, steels bordering upon the martensite steels which will take air quenching.

But these steels are inconvenient in one respect. A slight change in their chemical constitution will send them over to the class of martensite steels which are very difficult to work. Here are some examples of steels which will take air quenching:

1. C = 0.75, Ni = 3.82, Cr = 1.28, Mn = 0.52, Si = 0.17.

Annealed: R = 97.0, E = 76.8, A = 12 per cent, Σ = 40, impact = 30.

Air quenched at 850 degrees: R = 135, E = 132, A = 10 per cent, Σ = 20, impact = 8. (Brittleness less after than before quenching.)

2. C = 252, Ni = 5.43, Cr = 0.52, Mn = 0.33, Si = 0.22.

Annealed: R = 76, E = 64.3, A = 18 per cent, Σ = 60.2, impact = 20.

Air quenched at 850 degrees: R = 123, E = 105.4, A = 10 per cent, Σ = 48.5, impact = 12.

Water quenched at 850 degrees: R = 143.5, E = 128, A = 8 per cent, Σ = 42.3, impact = 10.

3. C = 0.366, Ni = 4.76, Cr = 0.92, Mn = 0.41.

Annealed: R = 95 to 100, E = 80 to 85, A = 12 to 15 per cent, Σ = 55 to 60, impact = 12. (Figures given by manufacturer.)

R = 143, E = 120, A = 7 per cent, Σ = 38.7, impact = 6.5 (values we determined.)

Quenched in air it should yield according to the manufacturer: R = 159, E = 125, A = 8 per cent, Σ = 40.1, impact = 8.

This last-mentioned steel exemplifies—in so far at least as my own experience goes—what I said above concerning decidedly martensitic steels.

Those steels would evidently *a fortiori* lend themselves to water quenching; indeed their mechanical properties would be enhanced by this treatment. But the very simple air quenching will do quite well in many cases.

The third actual tendency noticeable in the manufacture of special steels concerns the augmentation in carbon percentage in the case of steels for rubbing surfaces.

Broadly speaking, carbon is certainly the best agent which will impart mineralogical hardness. Chromium has the same effect, but it cannot equal carbon. For certain parts, where brittleness is less to be feared, the carbon percentage is increased as it seems to be correlated with wear by friction.

In exemplification I give the compositions of two steels which are made by the same French firm.

Type 1: C = 0.330, Ni = 2.43, Cr = 0.42, Mn = 0.43, Si = 0.26.

Type 2: C = 0.626, Ni = 2.6, Cr = 0.54, Mn = 0.22, Si = 0.32.

Personally I am not an advocate of high carbon percentages, and in practice—leaving apart the silicon steels which may contain up to 0.600 per cent of carbon—the metals which answer best are those containing at the highest 0.400 per cent of carbon; in a good many instances it will indeed be advantageous to keep below this figure.

To sum up, the three years which have elapsed since the last congress have only justified the conclusions at which we had arrived in the short note then presented: The industry of special steels for structural purposes turns more and more to the perlitic steels, and among these the nickel-chrome steels claim a position of increasing importance.

It cannot be said that new types of steels have been created since the Brussels congress. Yet certain steels which were already made at that period, but were not widely applied, have taken a great commercial development. These are the simple or complex vanadium steels, which have been gaining ground in America above all other countries, and the nickel steels, with or without chromium, which border upon the martensite steels and take air quenching.

## THE PREPARATION OF SILICON IN THE LABORATORY.*

By Samuel A. Tucker.

The reduction of silica by carbon in the electric furnace is now carried on quite extensively on a large scale, but its preparation in the laboratory has presented certain difficulties. The method here described can be worked very successfully and affords an interesting application of the electric furnace.

For the charge 12 kilos of a mixture of sea sand and gas coke in the proportion of 77 parts of sand to 25 of coke are used, and placed in a rectangular furnace of fire-brick giving a working space of about 10 inches x 9 inches, by 8 inches high, which should be cemented as tight as possible to prevent the admission of air. At a height of 3 inches from the bottom at each end openings are provided for the two horizontal graphite electrodes, 2 inch diameter. These electrodes are adjustable so that at the start the two ends are in contact, but as the operation proceeds they can be separated about 1½ inches to 2 inches.

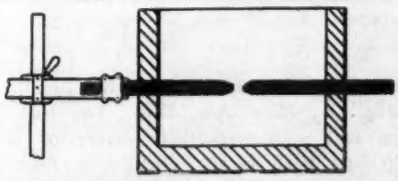
Alternating current was used in the experiments here described and the capacity available was about 50 kw., with means for regulation of the voltage and an impedance coil to balance the arc at the start. After a minute or so the impedance coil was cut out of the circuit and the arc maintained at the terminals of the alternator.

The charge being well mixed and ground so as to pass, say, a 10-mesh screen, is placed in the furnace to a depth of 3½ inches. The arc can then be started by withdrawing the electrodes and more of the charge added, carefully at first so as not to extinguish the arc, and then the rest of it so that the furnace is completely filled. The electrodes can then be given a little separation so that a longer arc is obtained and the process carried on in this way to the end of the run.

The first run was as follows:

| Time, Min. | Amperes. | Volts. |
|---|---|---|
| Start—3 | 300 | 54 |
| 13 | 400 | 65 |
| 28 | 580 | 30 |
| 38 | 650 | 31 |
| 46 | 500 | 36 |
| 53 | 500 | 48 |
| 63 | 500 | 48 |
| 64 | 50 | 54 |
| 71 | 360 | 58 |
| 81 | 300 | .. |

The gases find a vent and come off at considerable pressure and produce a great deal of vapor, so that good ventilation of the room in which these experiments are conducted is advisable.



Electric Silicon Furnace.

After the furnace has cooled down it will be found that a crater has formed about the arc and that approximately one-quarter of the charge has been used up. The silicon is found on the bottom and in the above run the yield was 200 grams, having all the characteristics of the commercial metallic silicon. The next run was made with the same furnace and charge, but the energy was greater, as the following figures show:

| Time, Min. | Amperes. | Volts. |
|---|---|---|
| Start—15 | 220 | 57 |
| 35 | 550 | 39 |
| 60 | 590 | 52 |
| 63 | 660 | 55 |
| 68 | 670 | 58 |
| 70 | 680 | 64 |
| 74 | 660 | 69 |
| 78 | 700 | 69 |
| 82 | 740 | 71 |
| 85 | 700 | 72 |

The yield in this run was 490 grams, but the heat was somewhat too great for the size of the furnace, as the brick work was melted in places and ran down with the silicon so that the specimen obtained was not quite so clear as in the first case. For the size of furnace used about 20 kilowatt-hours would be about right.

*Metallurgical and Chemical Engineering.

## A NEW UNIVERSAL DIVIDING HEAD.

Probably the most delicate and valuable attachment of the modern milling machine is the universal dividing head. It is used for a wide variety of work which must in general be accurate. The dividing head, therefore, must be in itself not only essentially accurate, but so constructed as to remain so. It must be compact and convenient and universal in range. That these considerations have been kept in mind is exemplified by the illustrations herewith, showing the new Universal dividing head brought out by the Kempsmith Mfg. Co., Milwaukee, Wis. The leading and most important feature of a dividing head is the dividing mechanism, and it will be readily grasped that the larger the diameter of worm wheel the less the angular error. In this head the worm wheel is mounted centrally inside the head block, and as will be seen, the worm shaft is located at an angle of 36 degrees from the horizontal, making possible a considerably larger diameter of worm wheel. For instance,

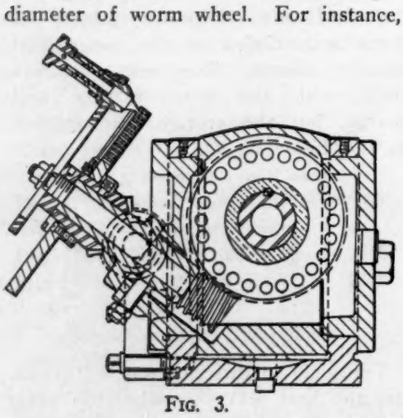


FIG. 3.

on the 10½-inch swing head the wheel is 5¼ inches diameter and on the 13¼-inch swing, 6½ inches diameter. The line drawings, Figs. 3 and 4, show the location and relative size of worm wheel. The worm and shaft are in one piece, supported by a long bearing extending up to the shoulder of the worm close to the point of engagement with the wheel. The worm runs in an oil bath and provision is made for taking up wear by means of the adjusting screw shown in Fig. 3. The worm is easily disengaged from the wheel for quick indexing through the wheel direct. The absence of gears between the index plunger and the worm shaft eliminates the possibility of error, and the shaft and index plate being set at an angle makes reading much easier for the operator. Two index plates are regularly provided, giving all division changes up to 60, all even numbers and multiples from 5 up to 120, and a liberal number of division changes between 120 and 400, and special index plates can be furnished providing additional changes not obtained through the standard plates. In Fig. 5 can be seen a special milling job of 127 teeth being milled through one of these special index plates. It will be noted that the angular position of the index plate permits of still larger plates being mounted without necessitating an increase in swing of head. With the worm and worm wheel disengaged, direct indexing is accomplished through the plunger seen over the spindle in Figs. 1 and 2, engaging the circle of holes in the worm wheel as shown in Fig. 3. The nose of the spindle is graduated to correspond with these holes, and is therefore easily read. This quick indexing is valuable in milling squares or hexagons, fluting taps, reamers or similar work. The spindle is finished with the same taper and threaded nose as the main spindle of the millers with which the head is regularly furnished, so that tools are interchangeable, and has a large hole through which work can be passed. The rear end is arranged to receive an extension stud for use in gearing direct from the lead to the screw spindle for cutting fine leads, as shown in Fig. 6, which also shows the readily detachable change gear bracket. Through this bracket also the indexing worm can be driven direct from the change gear shaft by means of miter gears. Fig. 6 also shows the use of the universal milling attachment where the angle between the cutter and work is greater than can be obtained through the swivel table. Fig. 7 shows the method of testing the accuracy of every tooth of the worm wheel by means of the master plate, which is mounted on the spindle and has 40 perfect divisions, and by which it is therefore possible to test the relative and cumulative error for the individual teeth. The maximum

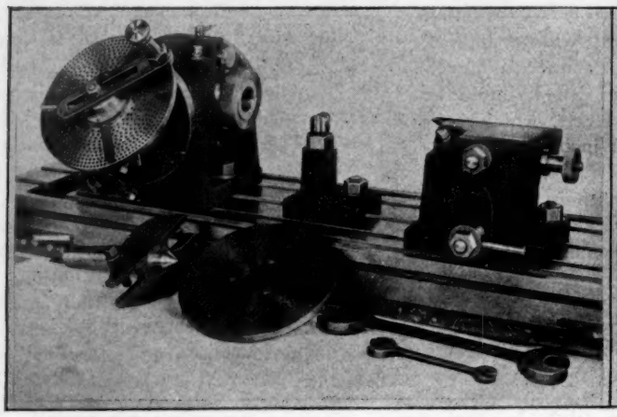


FIG. 1.

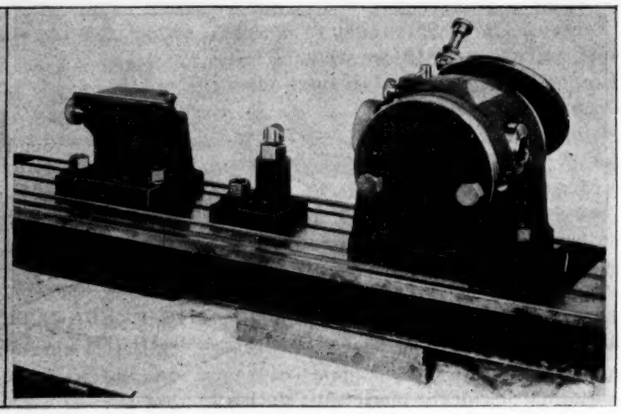


FIG. 2.

relative error allowed is 0.0005 inch on the master plate, and the maximum cumulative error at any point is 0.002 inch on the master plate. The average is less than half of this. As the master plate is 11 inches diameter and the worm wheel 5¼ inches diameter, the errors in the former are correspondingly reduced in the latter. The tail stock is of the well known side center type, with the center set into the block on an angle, so that the center line is brought within

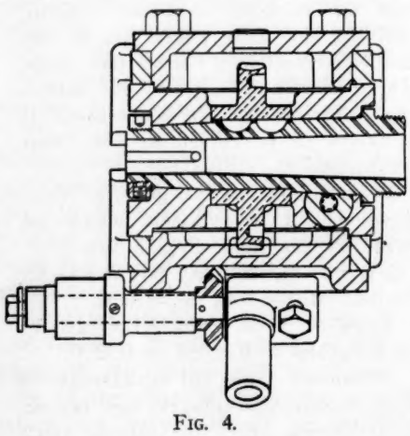


FIG. 4.

⅛ inch of the inner and upper surfaces of the tail stock, as can be seen in Figs. 1 and 2. The center is readily adjustable either longitudinally or vertically, and can be tilted and clamped at any angle.

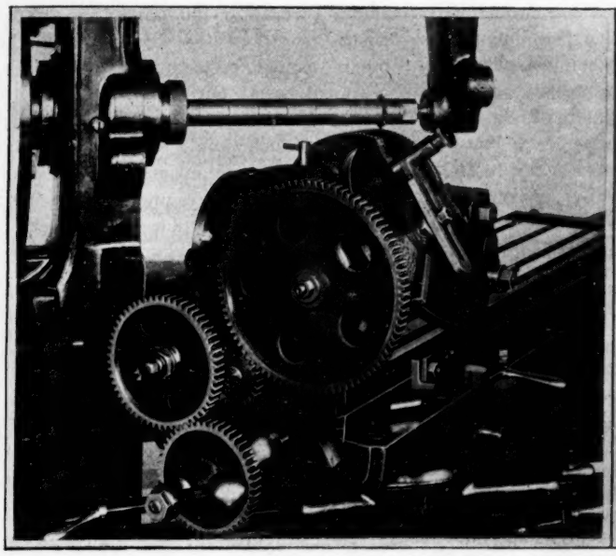


FIG. 5.

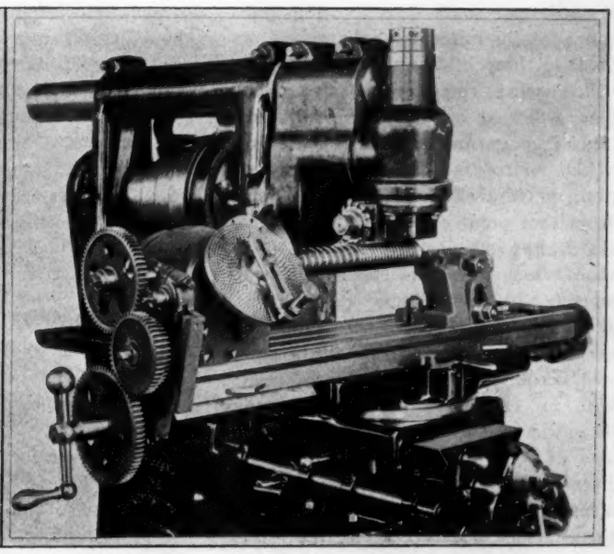


FIG. 6.

## IRON ORE DEPOSITS IN BRAZIL.*

By O. A. DERBY.†

Iron ores are known in every state of Brazil, but definite information regarding most of the deposits is lacking. The greater part of the specimens exhibited in museums are magnetites, and of these the majority have proved to be quite highly titaniferous. A good number of specimens of excellent hematites representing numerous widely separated localities, have also appeared.

The districts regarding which definite information is at hand are those belonging to the states of Mines Geræs, Sao Paulo, Bahia, Goyaz, Paraná, Santa Catharina, Rio Grande do Sul and Matto Grosso. The ores known in the first three and the last of these states are predominantly hematites; in the others, magnetites.

With a single exception none of these districts have been studied in a way to give definite information on the subject of iron ore supply. The district that has been investigated is situated in the eastern central part of Mines Geræs, in the section of the Espinhaco range that forms the divide between the Rio Doco and the Sao Francisco drainage systems, extending over about two degrees of latitude with a width of about one degree of longitude. This is also the most productive of the goldfields of Brazil, and in consequence is one of the oldest and most densely populated of the interior regions of the country. Notwithstanding this fact, however, it has only been very imperfectly mapped, and there is a singular lack of reliable and accurate information regarding its geological and ecomomic features. This lack is now being supplied by a small party of the Servico Geologico e Mineralogico do Brazil, under the direction of Dr. Luiz Felippe Gonzago do Campos, that for the last two years has been occupied in mapping the district, both topographically and geologically. Thus far only about one-half of the known ironfields of Brazil has been covered by this work, which is of a reconnaissance, rather than of a definite character.

### Communication with Seaboard.

At present the only all-rail means of access is by the Central Railroad of Brazil, which, starting from the port of Rio de Janeiro, enters the district at its southern border, traverses it in

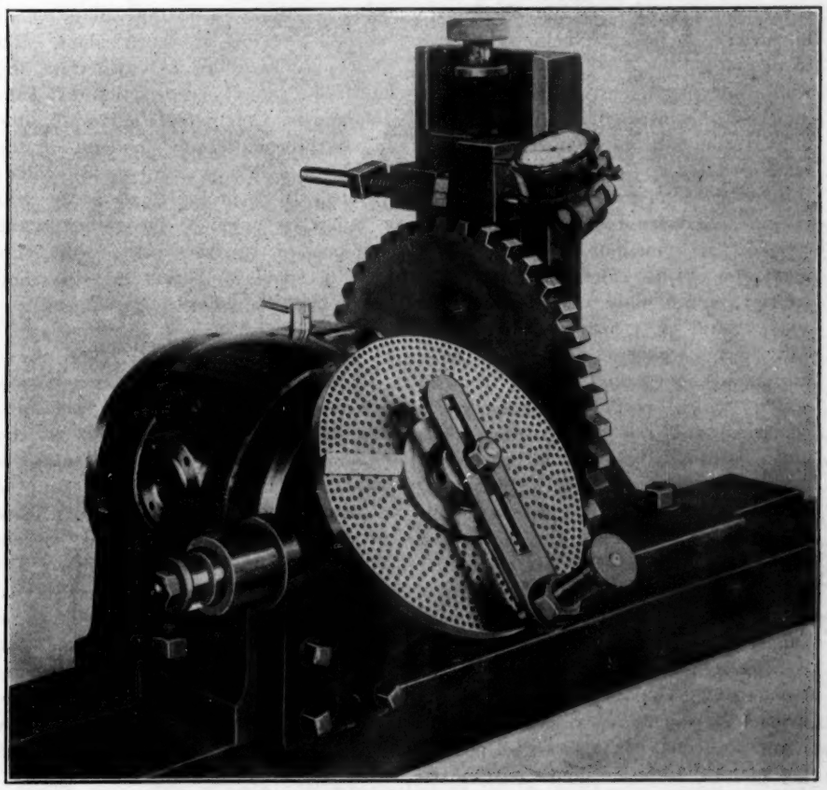


FIG. 7.

*Abstract of report prepared for the International Geological Congress.

†Chief of the Geological Survey of Brazil.

a north and south direction for a distance of 56 miles to Sabara and extends a branch transversely across it, which, when completed to Santa Barbara, will have an extension of 37 miles. This is government road with a gage of 1.6 metres for 314 miles to the station of Miguel Burnier and 1 metre from that point onward. The Leopoldina Railway, a narrow (1 metre) gage road belonging to an English company, starting from the same port, with a present extension of 390 miles, will eventually tap the district at its northeast corner at Itabira do Matto Dentro with an extension of about 54 miles. The Victoria and Diamantina Railroad, also of metre gage, and belonging to a French company, is now under construction from the port of Victoria, in the State of Espirito Santo, toward the same point (Itabira), which it can reach with an extension of about 390 miles. It is understood that the company proposes to complete this line as soon as possible and to equip it especially as an ore-carrying road. If this is done, and if the port of Victoria, which is an excellent one, is properly equipped with handling facilities, one of the most important parts of the district will have a satisfactory outlet in the near future.

### Geological Features.

The part of the region that has been mapped with approximate accuracy containing the iron-bearing formation, covers an area of about 5,700 square kilometers. The ore field is known to extend to the northward, north-eastward, and south-westward beyond the limits of the map, which thus embraces only from half to two-thirds of its total area.

In its essential geological features the region is constituted by a basement complex of crystalline schists (igneiss, mica, amphibole, chloride, and talcose schists), much injected with granite, and overlaid by a heavy series of partially metamorphosed sedimentary beds, profoundly folded and faulted. In this series, which consists principally of quartzite sand clay slates with subordinate beds of limestone, a prominent member is the peculiar iron-bearing quartzite, to which the name of "itabirite" has been applied. This name was originally proposed by Eschwege, in 1822, for the massive, pure iron ore of which the peak of Itabira do Campo, among others, is composed, and which is associated with a schistose rock composed of granular quartz and scaly hematite, which he discriminated as iron-mica schist. This shows all possible graduations, from an almost pure quartz rock with scattered flanks of hematite to a massive hematite free from quartz. The latter presents itself as intercalated layers, or lenses, varying from a few millimeters up to scores of meters in thickness, alternating with leaner quartzose portions. When limestones are associated with the series, they also are more or less heavily charged with flakes of hematite, and are frequently associated with commercially valuable ores of both iron and manganese.

### Classes of Ore.

Taken as a whole, the itabirite beds, which are often of great thickness, become, when exposed to the weather, extremely friable, and as the region is one of heavy rainfall (60 to 80 inches) they have been extensively denuded. In consequence of this, the massive portions, when they occur, stand out as topographical features; the rain- and wind-swept slopes become covered with a rubble of iron ore due to the breaking up of the thinner intercalated layers, more or less completely freed from the associated silicious elements by rain and wind action, and the bottom lands of the valleys become charged with deposits of iron sand separated by the natural sluicing of the streams. There are thus produced from the same series of beds three classes of ore, namely:—(1) Quarry ore, in the peaks and other natural exposures *in situ* of the massive portions of the rock; (2) rubble ore, on the denuded surfaces; and (3) sandy ore, in the valleys where sluicing action has taken place. To these must be added a fourth class, the so-called "canga" (contraction of Tapanhoacanga, *i. e.*, "Negro's Head"), due to the cementation by limonite of the rubble ore into a hard-stone conglomerate. It is probable, also, that still a fifth class might be recognized in the outcrops of quartz-hematite rock sufficiently friable to permit the separation of the metallic mineral by sluicing.

### Estimate of Deposits.

The cubic contents of a limited number of the ore bodies have been estimated by competent observers on the basis of actual approximate measurements of their outcrops, but for the most part this has been done by private parties, and the information is not available. The estimates made by Dr. Gonzaga do Campos, of the Servico Geologico, are believed to be as reliable as can at present be made, and will serve to give an approximate idea of what the figures may amount to when the district becomes better known.

Taking the specific gravity of these ores as four, this volume represents 988,000,000 tons. The above list includes several of the largest-known deposits, so that the contents of the others cannot be estimated on a proportional basis; but it seems quite safe to assume for them at least an equal volume, which would double the above figures. In these estimates no account is taken of the presumed underground extension of the visible ore bodies.

ESTIMATES OF BRAZILIAN IRON ORE DEPOSITS.

| | Cubic metres. |
|---|---|
| Gava | 72,000,000 |
| Concelcao | 80,000,000 |
| Esmeril | 19,000,000 |
| Caue (Itabira peak) | 33,000,000 |
| Pitanguy | 14,000,000 |
| Sao Luiz | 8,000,000 |
| Peak of Itabira do Campo | 8,000,000 |
| Rio de Peixe | 10,000,000 |
| Cocaes | 3,000,000 |
| Total | 247,000,000 |

No attempt has been made to estimate the volume of the rubble-ore deposits, which are both numerous and extensive throughout the district. As regards the "canga," Dr. Gonzaga do Campos estimates that it covers about 10 per cent of the area occupied by the iron-bearing formation, which is about 5,700 square kilometers.

### Quality of the Ores.

As regards the quality of these ores, the analyses at hand are naturally of hand specimens only, but mineralogists and metallurgists who have examined the outcrops agree that on immense rock faces, such as represented in the peak of Itabira do Campo, no differentiation of richer and poorer portions is perceptible to the eye.

Most of these analyses are deficient from an industrial point of view, as in the majority of them the phosphorus content is given vaguely as "traces," without accurate determination, and no reference is made to titanium, leaving it doubtful whether this element had been especially looked for or not. The iron oxide content is generally given as from 97 to 99.5 per cent, the remainder being almost exclusively silica. In two cases in which special tests were made for titanium none was found, and from this and other considerations it seems safe to assume that as a class these ores are practically free from it. The most reliable phosphorus determinations at hand are from samples from two different localities submitted to the Krupp Works and to those of the United States Steel Corporation, both of which give the same result—namely 0.0024 per cent.—*Iron and Coal Trades Review.*

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The American Manganese Bronze Co., Philadelphia, has sold the one-story foundry on a one-acre plot at Rhawn and Hegeman streets to the Holmesburg Realty Co., for $20,000.

## AN EFFICIENT APPARATUS FOR METALLOGRAPHIC WORK.

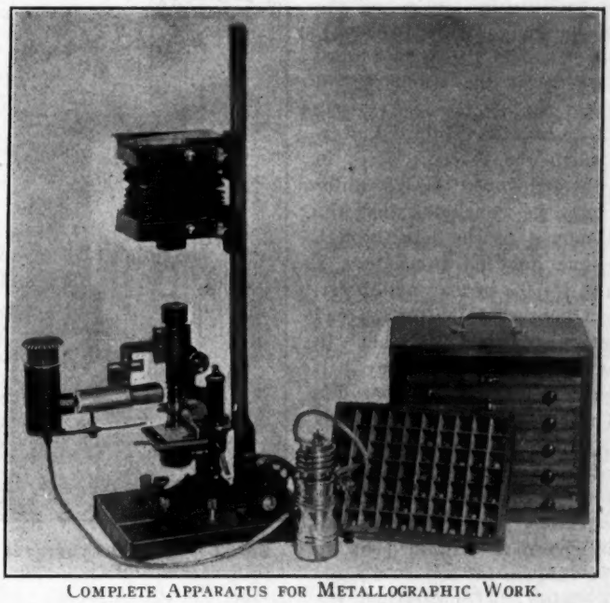
By S. S. Knight.[1]

Thirty years ago, the advent of applied science in the iron and steel business, caused somewhat of a commotion among those who had been used to the old methods, which were based upon experience which had been obtained in the carrying on of actual operations of manufacture without well understanding their relations to the fundamental facts upon which they depended. The chemical laboratory and its close ally—the physical testing apparatus—had only thoroughly established their value when European investigators began to use the miscroscope upon iron and steel sections, and in a vague way outline the possibilities of the application of the science of metallography to the iron and steel industry. As is usual with all investigations of this kind, the lack of efficient apparatus greatly hampered the work, and it has been the writer's experience during the 15 years which he has been studying metallography, to have purchased and discarded no less than four complete outfits, owing to the rapid advance which instrument builders have made, and today, for the first time, he has an equipment which is anything like satisfactory. An illustration of this is shown, the microscope stand itself being equipped with full sub-stage illuminating apparatus so that the stage micrometer can be used with the highest power lenses and the actual magnification of specimens at all times readily ascertained. When specimens are being examined, the pack camera is swung back upon the arm, entirely out of the way; and if a photo-micrograph is to be taken, it is merely a matter of swinging the camera up over the microscope and leaving the eye piece in and taking the picture immediately. The most difficult part of metallographic work is the securing of the proper illumination, and this has been largely overcome by the apparatus shown in the cut.

The condenser itself is the invention of Wirt Tassen, formerly of the Smithsonian Institute, but now of Chester, Pa., and the clamping of this condenser to the tube of the microscope itself, obviates all difficulty such as is had with other forms of apparatus, owing to the fact that the illumination always follows the lens, regardless of whether a low power, such as one inch, or a high power, such as one-eighth inch, is being used. The petrographic nose piece enables the most rapid changing of the objectives, while the mechanical stage offers an easy and rapid means of thoroughly investigating the entire field shown on the specimen. The specimen holder, which the writer understands is the invention of Prof. Sauveur, of Boston, is also a great time saver, inasmuch as the specimens do not have to be mounted in any way, and several faces can be looked at upon each specimen.

The source of illumination, or acetylene burner, being carried right on the condenser, and being fully enclosed with an opaque sheet iron chimney, makes the room, in which the photo-micrographs are being taken, dark enough, if the outside light is cut off, so that any image upon the ground glass is readily seen. The small acetylene generator is very easily operated and controlled, and where compressed acetylene can be obtained, of course, this can be done away with, and a tank used. The writer has found in his work, extending over about 15 years, that a cover glass illuminator is much preferable to one of the prism type. The entire outfit, as shown with five achromatic objective and three huyghenian eye pieces, can be purchased in the open market in almost any large city for something under $175.00. By using the most sensitive dry plates, magnifications of upwards of one thousand diameters can be readily photographed with an exposure of less than five minutes; while such magnifications as range between 75 and 250 diameters require from 15 to 25 seconds.

It is surprising to know the number of individual investigators engaged today in America in the science of metallography as applied to the iron and steel industry, but an idea of this may be obtained from the fact that there is hardly any large plant producing steel which has not at least one man interested in this line of work connected with it. Its immense value has been well demonstrated and is beginning to be widely appreciated, and it is beyond question that the science of metallography almost completely fills the void left by the chemical laboratory, inasmuch as through the latter the composition of the material may be obtained, while through the former, its heat treatment is clearly shown. Since these are the two controlling influences upon which the quality of iron and steel are entirely dependent, the work of one almost completely supplements that of the other.



Complete Apparatus for Metallographic Work.

[1]Gen. Manager, Chester Steel Castings Co., Chester, Pa.

## A NOVEL TYPE OF MICROMETER.

By Dr. Alfred Gradenwitz.[1]

Though a number of improvements of the micrometer have been suggested from time to time, no departure has been made from its familiar construction.

The first micrometer based on a distinctly novel principle is the apparatus represented in Figs. 1 and 2, which has recently been designed by Maurice Picard, in conjunction with another specialist, Maurice Colomb, of the Geneva Watch Co.

This curious instrument allows of a precision so far unheard of, measuring 1/1,000 of a millimeter (about 1/25,000 inch) with certainty, while being extremely simple to handle.

As seen from Fig. 1, the micrometer bears a certain likeness to a mercury barometer. In fact, the vertical glass tube on the left hand, which

[1]Berlin, Germany.

is bent over at the top, terminating in a bulb, is partly filled with mercury. This tube, which is 50 centimeters (19.5 inches) in useful length, communicates with a small cylinder located below the platform of the machine, to the left of the latter. A piston is free to move in this cylinder and, by its motion, throws out a minute quantity of mercury into the vertical tube, causing it there to rise to a height dependent on the displacement of the piston. Alongside the tube is seen a scale on which the motion of the piston is read.

**The Operation of the Micrometer.**

Now, as the piston moves to the left, through one millimeter (0.039 inch), the mercury rises to the very top of the tube, traversing the whole length of the latter, *i. e.*, 500 millimeters. As the tube is accurately calibrated, it is seen that when the mercury rises in the tube, through only, say 5 millimeters, it may be concluded that the piston has moved to the left through a distance one hundred times less, i. e., through 1/100 of a millimeter. Now, it is a very easy matter to read 5 millimeters on the vertical scale. In fact, a much smaller length, say half a millimeter, can be read without difficulty. This displacement of half a millimeter, however, corresponds to a left-hand motion of the piston through 1/1,000 of a millimeter. This shows in what enormous proportion the motion of the piston is magnified by so simple an arrangement.

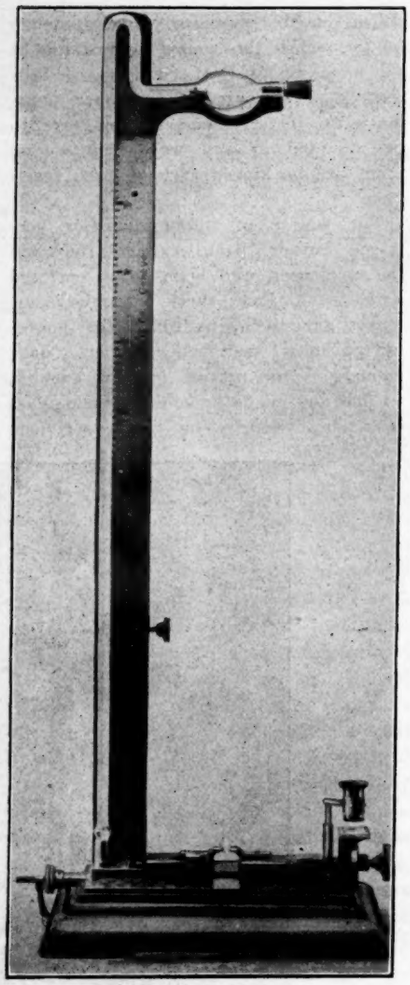


FIG. 1—THE MICROMETER COMPLETE.

In order better to understand the mechanism of the apparatus, let Fig. 2 be referred to, where an enlarged view of the lower part is given. At the right of the platform is seen the micrometer screw $V$, which has a pitch of 1 millimeter, cut with remarkable precision. This means that at each revolution of the screw, there is a displacement through one millimeter. Now, the screw $V$, in moving to the left, causes a jaw $T$, rigidly connected to it, to move on in the same direction. Opposite $T$ is seen another jaw $T^1$, which is rigidly fixed. Besides this jaw, which is only of half the width of the jaw connected to the screw, is a third jaw $T^2$, which is kept by a spring in accurate agreement with the jaw $T^1$. This spring is compressed as soon as any obstacle throws it back to the left, and the rear end jaw $T^2$, acts on the piston above referred to.

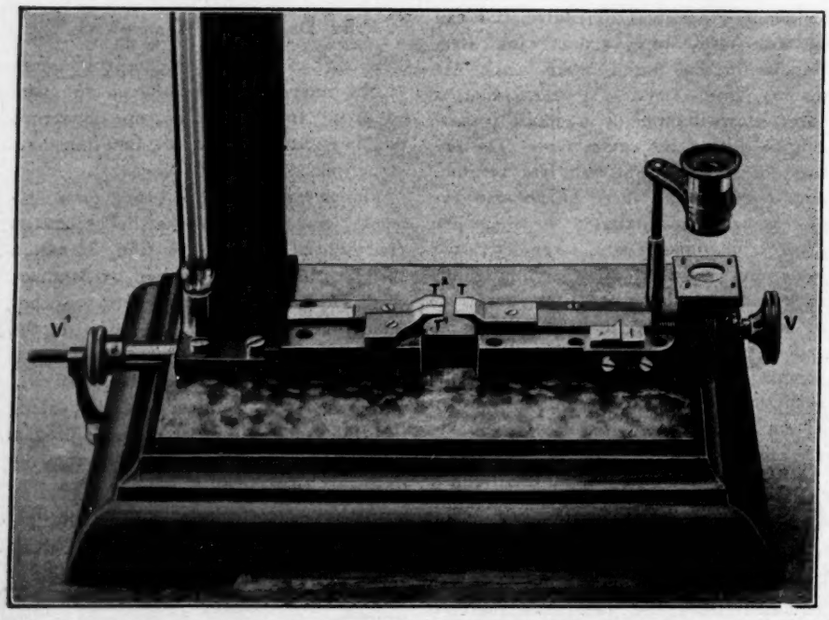



FIG. 2—ENLARGED VIEW OF BASE OF MICROMETER.

**Method of Making Measurements.**

In order now to measure any piece, this is placed between the jaws $T$ and $T^1$, no account being taken for the moment of the jaw $T^2$. In order to place it in its proper position, the micrometer screw $V$ has had to be moved through a certain number of turns and is now distant from its initial position by a certain length corresponding to a given number of turns and a fraction of a turn. This length is estimated in millimeters by means of a millimeter scale seen on the figure. However, this is only a coarse measurement, giving no accurate reading of the fraction.

In order to effect this accurate reading, the movable jaw $T^2$ is resorted to, which, by acting on the piston and thus on the mercury, will yield the complement of the former measurement in thousandths of a millimeter on the vertical scale of the glass tube.

After placing the sample between the jaws $T$ and $T^2$, the micrometer screw is turned back until the distance between $T$ and $T^1$ is accurately equal to the number of millimeters, minus the fraction, which had been obtained in connction with the preliminary measurement. The small eyeglass seen in the figure allows this to be done with high accuracy; the screw $V$, in fact, carries a small additional drum, on which is traced a single division, and after each complete turn, this line is seen accurately below a thin steel wire stretched across the circular glass visible below the eyeglass.

However, the object placed between the jaw $T$ and the movable jaw $T^2$ exceeds by a certain amount this accurate number of millimeters, and in order to give way just by this amount, the movable jaw is compelled to recede, actuating the piston above mentioned, which in turn moves the mer-

cury up into the vertical tube, a distance corresponding to the displacement of the piston, or, rather, of the movable jaw.

This amount obviously gives, in thousandths of a millimeter, the dimensions of the sample, minus the complete number of millimeters read on the micrometer screw.

A screw $V^2$ has been provided for re-adjusting the mercury of the vertical tube. A. substance placed in the bulb at the top of the apparatus absorbs any moisture liable to penetrate and to disturb the working of the micrometer.

The apparatus above described will be found a most useful adjunct to the equipment of those workshops where a high accuracy is required.

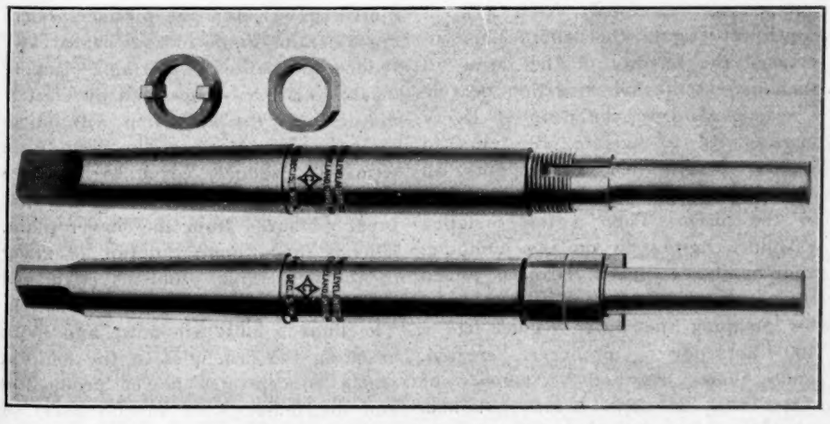
## A NEW ARBOR.

The illustration herewith shows a new arbor for shell tools, which has been brought out by the Cleveland Twist Drill Co.

The essential difference between this arbor and the ordinary type is the adjustable collar provided with integral keys, which slide in longitudinal keyways in the arbor. The arbor is also threaded for a short distance to receive an adjusting nut, which bears on the collar. The collar engages the shell reamers in the usual way.

The chief advantage of the new tool is in the quickness and ease with which the shell tool may be released, no matter how tightly it may have become jammed on the arbor, by a turn or two of the adjusting nut and avoiding the necessity of removing the arbor from the spindle or socket and without resorting to the vise and hammer methods, which are often the cause of considerable damage and delay.

Another decided advantage is in the fact that the adjustability of the collar allows full engagement of slots and cotter keys with slight variations of fit of shell tool.



AN ADJUSTABLE ARBOR FOR SHELL TOOLS.

## INCREASING USE OF PRODUCER GAS PLANTS.

BY A. S. ATKINSON.*

The steadily increasing use of producer gas plants in many of the industries indicates that this form of power will to a large extent replace the steam boiler and steam engine and incidentally tend toward the centralization of power development and distribution. In the early stages of development of the gas producer, the designs were nearly all made for anthracite coal, and when tests were made with bituminous coals, lignites and peats the results could not be as high as desired. Nevertheless, the fact was demonstrated that a single plant had a remarkable range of fuels, and that nearly all grades could be burnt economically in the producer.

But the engineering practice of today the gas producer is designed particularly for certain grades of fuel, and as a result a much higher efficiency is obtained. The new type of bituminous gas producer is an achievement of engineering that has greatly accelerated the use of this type of power producer.

Today the demand for special types of producers is apparently limited only by the output, and many of the factories have all the orders they can possibly fill for a long time ahead. This demand for gas producers increases as new practical demonstrations are made, showing their economy and efficiency, and this must prove of remarkable value in nearly all kinds of manufacturing.

With the practical development of the bituminous gas producer there has sprung up manufacturing interests in parts of the country that formerly had no possible chance of great development. In the vicinity of the great lignite coal beds of the northwest manufacturing communities are being established, and the same will shortly be true near the great peat bogs.

Engineers agree now that the solution of the peat problem is to be found in the gas producer. With especially designed producers peat can be utilized economically for power production, and some of the producers show nearly as high an efficiency with peat as with lignite coals. The gas producer for burning peat is still in a stage of transition, but it will not be many years before it will become as practical a machine as that used for low-grade coals.

Meanwhile, the bituminous producer has come into its own and it is now being operated quite generally. The large manufacturers of these plants have not been hasty in their claims, but have spent years in testing them before they put them on the market. For instance one type of bituminous gas producer has been running a full year under the severest tests before any attempt was made to market it. This producer was designed for various forms of bituminous coals, and the requirements were a producer capable of continuous operation, producing a gas free from tar, operating at such temperatures as would avoid troublesome clinker formation, producing a gas of normal constituents suited to high engine compression, and finally, that could be readily operated by a single attendant with comparatively little labor and skill.

### A Design for Each Fuel.

A pretty high standard certainly, and to reach it required almost a perfect machine, but in the tests running over a whole year the desired results were practically obtained. These tests embraced the use of South American lignite coal, Colorado lignites, Texas lignites, Pittsburg run-of-mine coal, and Massachusetts meadow peat. Here was included nearly every grade of cheap fuel that a manufacturer in any part of the country would be apt to use.

In these tests it was found that good efficiency could be obtained with any of the fuels, and their relative value was ascertained. All of the tests were conducted on ten and twenty-four hour durations so that the producer could demonstrate its capacity for continuous steady work. The average samples of gas taken from the engine showed a heat value of about 115 British thermal units, but considerable higher value could be obtained by using more vapor and producing higher hydrogen content. But high gas was not desired, as it would not permit of high compression in the engines for which a gas of moderate heat value is better suited.

*Box 1189, New York.

The chief thing to be noted in the improvement of gas producers in recent years is that special designs are made for certain fuels, and that no attempt is being made to include too wide a range of coals. The producer designed for anthracite coal could hardly be expected to burn peat with success and high efficiency. But, broadly speaking, two distinct types only are needed—one for anthracite or high grade fuels, and the other for low grade coals, including peat, although the peat producer must be further improved and modified. In the tests referred to above, the results obtained with Massachusetts peat were remarkably good, but even better things still are expected. The moisture and volatile matter in the peat burnt were much greater than in any of the other fuels, and the fixed carbon about one-half, the Texas lignite coming next to it, but the ash left was smaller, and the actual heat units developed, pound for pound of fuel, only a little less than that obtained from the Texas lignite. The British thermal units developed from each pound of peat were 6,410 against 6,950 units from the Texas lignite and 8,032 and 8,599 from the South American and Colorado lignite, respectively.

**Electricity From Low-Grade Fuels.**

In this test the peat did not make a bad showing, especially when we consider that it contained over 38 per cent of moisture and 41 per cent of volatile matter. The use of a producer for burning peat and lignite coals must eventually greatly influence the fuel problem of large sections of the country. In the vast regions where soft brown coals and peat bogs are found, the production of power by means of the gas producer will eventually serve to build up great industries. This is the mission of the gas producer designed for low grade fuels.

Gas power is becoming more and more a factor in the generation of electric energy, and the new types of gas producers for low grade fuels will greatly accelerate the evolution in favor of gas. A suction gas plant will burn a pound of good pea anthracite coal per brake horse power per hour when running at full load, and at a half load the consumption is about 1.5 pounds. Pea anthracite costs all the way from $4 to $7 or $8 per ton, depending upon location and distance from mines and tide water. In peat regions where bogs are abundant, it costs less than $1 a ton to cut and deliver a short distance. It is estimated that in the great soft coal regions of the northwest, the lignite or brown coals could be delivered to power stations at less than $1.75 per ton. From these soft coals and peat we would not get the same efficiency, but from each pound of fuel it is estimated that only about one-third less power would be obtained than from pea anthracite. It is easy to figure out the cheaper cost of power production that would result from this use of low grade fuel.

**The Producer on the Farm.**

The fields of development for the gas producer designed for low grade fuels are almost unlimited, and into some of these it has already demonstrated its fitness. The concentration of power would be the first important step. A gas producer in a farming region could thus be utilized co-operatively in doing heavy work which is now done less economically by hand or by smaller individual machines. For instance, irrigation and pumping stations could be more economically run by a producer using peat or lignite coals than small gas engines on each farm. This has been abundantly demonstrated in the past year in California and parts of the arid west where pumping stations have been operated by gas producers of this type. Added to this is the development of the electrical unit. In a farming community where land is dependent upon water from irrigating pumps, the lighting of the houses and streets is an incidental improvement of great value. As the gas producer is not required for continuous pumping, the power that would otherwise go to waste can be utilized for generating electricity for lighting.

In California, near Redlands, there is a model farming community which was developed into a model farming town through the modern influence of machinery. The farms were first cultivated without irrigation, and they proved unsatisfactory. Then a few windmills were erected, and water pumped up laboriously from a great depth to irrigate the land. This increased the fertility of the farms to such an extent that irrigation became a watch word of the people. Every one wanted to irrigate. A few had electric pumps installed, tapping an electric cable that ran within five miles of the place. Then a few installed gasoline engines to do the pumping, and finally, a dozen farmers joined together and installed a gas producer for pumping the water. They had a 100 horsepower producer erected, and there resulted a flow of water such as never before obtained. They had more than they needed, and began to sell the water to other farms. This proved so successful that they had a larger producer erected, and then once more having a surplus of power, converted it into electricity and lighted their homes.

Sometime ago they sold out to the town which sprang up in their midst. This town now supplies water to the farms for irrigation and also for drinking purposes, and lights the streets and houses. It is a model town and farming community, developed through the co-operation of the few farmers who first decided that they could accomplish more by pooling their interests and securing the cheapest form of power producer.

The producer gas plant has made itself felt in the lumbering and logging regions of the country also, and its adaptation here is furthermore increased by the more or less successful efforts to use saw-dust mixed with chips and a certain portion of soft coal. There are no producers known to the writer adapted specially to the burning of saw-dust, but some of those designed for low grade coals and peat have been tested with fuel composed in part of saw-dust and even with corn-stalks. Such fuel contains very little ash, but a considerable proportion of moisture and volatile matter. The amount of fixed carbon is relatively small. In these respects it resembles quite closely Massachusetts peat.

**The Utilization of Wood Waste.**

The development of a producer that would utilize saw-dust, fine chips, shavings and other waste products of a lumber camp and saw mill would undoubtedly create great changes in many parts of the country. At present these waste products are mixed with coal of different grades, and the results are quite satisfactory. But in lumber camps and saw mills where steam has heretofore been used as the motive power, the gas producer burning the same grade of coal has greatly reduced expenses. Portable sawing machines are now operated by electric motors, and the next step will be an electric generation set in connection with the producer plant so that the sawing machines can be operated at great distances from the power plant. This is the ultimate solution of many of the perplexing problems connected with economical lumber production. The lumber mills are more and more adopting the principles of the factory, which concentrates power production and distributes it to various parts of

the plant by means of electrical cables or long shafts.

Under ordinary conditions the producer plant can easily displace a steam engine and save money for the operators, and even under unusual conditions it has demonstrated its fitness for special lines of work. It has invaded the mill and factory; it has successfully displaced other forms of power developers for irrigation, pumping works and for electric lighting; it has, in short, become an important factor in upward of half a hundred different industries which go to make up our great manufacturing world.

## WESTERN SOCIETY OF ENGINEERS.

The officers of the Western Society of Engineers for 1910, elected by letter ballot, are: President, J. W. Alvord, Chicago; first vice president, O. P. Chamberlain, Chicago; second vice president, A. Bement, Chicago; third vice president, W. K. Hatt, Purdue University, Lafayette, Ind.; treasurer, A. Reichman, Chicago; trustees for one, two and three years, L. E. Ritter, G. M. Brill and W. W. Curtiss. The society's headquarters are located in the Monadnock block, Chicago. The annual meeting and dinner of the society, at which the new officers were inaugurated, was held at the University Club, Chicago, in the evening of Jan. 12.

## BOOK REVIEWS.

**The Internal Combustion Engine.** By H. E. Wimperis, Whitworth Scholar, etc. 320 5½ x 8½-inch pages. New York, 1909, D. Van Nostrand Co. Supplied by THE IRON TRADE REVIEW for $3 net.

While we can scarcely agree with the author in his statement that "it is remarkable that there should be no English text book on the subject of the internal combustion engine" in view of the various works on the subject which have made their appearance during the past two or three years, it was scarcely necessary as an apology for his work, which is of sufficient merit technically to stand by itself even if the works referred to were still more numerous than they are. We differ entirely from the author when he says "acquaintance with the elements of the calculus is now so widespread that space has not been taken up by the adoption of methods which would avoid its use," and precipitates the reader almost at once into its depths. The author's acquaintance with the calculus is evidently more intimate than with those who will chiefly turn to his or other works on the subject, and we think he would have added immensely to his circle of readers by the adoption or addition of more generally understood operations. Otherwise the technical treatment is excellent. The illustrations, however, leave much to be desired; a serious fault in a work of this character, and when the cost of good cuts is comparatively moderate. Unless a cut is clear and distinct it not only fails of its purpose but detracts from otherwise meritorious features, and the line drawings of the Diesel and Thornycroft and Cokerill engines, for example, are decidedly inferior. The book is, however, a valuable addition to technical literature.

**Internal Combustion Engines.** By Wm. M. Hogle. 250 5½ x 8½-inch pages. New York, 1909, McGraw Publishing Co. Supplied by THE IRON TRADE REVIEW for $3 net.

This is announced as a reference book for designers, operators, engineers and students, and its existence as being due to the lack of satisfactory, compact reference books on the subject. There are 24 chapters disposed of in 216 pages, the balance being made up of logarithmic and trigonometric tables, etc., so that its compactness may be taken as demonstrated. If the lack of "satisfactory" reference books exists at all, we think the situation has been relieved but little. For example, the suction producer is disposed of in less than two pages of actual type. Statements from manufacturers' catalogs worked into a reference book as reliable and authoritative matter do not help to make it satisfactory. The internal combustion engine is not in need of exaggerated comparisons as to heat efficiency as compared with steam to make its case good, and while these extreme comparisons are well enough in advertising matter, they do not correctly represent normal conditions. The cause of the gas engine, and its coadjutor the producer, is advanced not at all, but rather the reverse, by such ill considered matter. It is not book making.

## NEW PUBLICATIONS.

FUEL TESTS WITH HOUSE HEATING BOILERS.—By J. M. Snodgrass. Issued by the Engineering Experiment Station of the University of Illinois as Bulletin No. 31. This bulletin is designed for the technical rather than for the general reader. It will be of interest to producers of fuel for domestic heating and to those who are concerned with the design and method of house-heating apparatus. Comparatively few tests have hitherto been made in connection with house-heating apparatus, and the results of this bulletin constitute a timely definition of its efficiency. The fuel used included anthracite coal, Pocahontas coal, and various grades of Illinois bituminous coal. The relative advantages to be derived from the use of these several fuels in house-heating apparatus are discussed and their relative value is defined. It appears that Illinois coal, while less efficient than others tested, supplies through its low cost the least expensive means of heating. The conclusion that the use of Illinois coals in such service must continue to increase is apparent. By the careful preparation of such fuel, the dirt, soot and smoke resulting from its use may be materially reduced. The bulletin is intended to constitute the first of a series dealing with fuels and apparatus used for house heating or other domestic purposes. Copies may be obtained gratis upon application to W. F. M. Goss, director of the Engineering Experiment Station, University of Illinois, Urbana, Ill.

OLIVE COAL.—Illustrated booklet descriptive of the coal mining operation of the Columbus Iron & Steel Co., Columbus.

"NEW BRITAIN" VISE STAND AND BENCH.—Leaflet distributed by the New Britain Machine Co., New Britain, Conn.

"HAUCK" OIL FUEL BURNERS.—Booklet distributed by the Hauck Mfg. Co., 140 Cedar street, New York City.

"GOLDEN ANNIVERSARY," LYON, CONKLIN & CO.—This company, located at Baltimore, Md., is issuing a neat memorandum book in honor of its fiftieth anniversary in the roofing plate business.

THE PRODUCTION OF GOLD AND SILVER IN 1908.—By Waldemar Lindgren and H. D. McCaskey; advance chapter from mineral resources of the United States for Calendar Year 1908; Washington, U. S. Geological Survey.

## NEW CATALOGS.

POWER TRANSMITTING MACHINERY.—Catalog No. 9, 58 4 x 7-inch pages, has been issued by the Bond Foundry & Machine Co., Manheim, Pa., and describes a list of transmission machinery covering shafting, hangers, pulleys, rigid and adjustable pillow blocks, couplings, etc.

STEAM ENGINES.—The Russel Engine Co., Massillon, O., is distributing a 24-page 8 x 11-inch catalog, descriptive if its self-oiling engines, in single and four valve types, simple and compound, including numerous illustrations of details of construction.

ELECTRICAL TACHOMETERS. — Bulletin No. 33, issued by the Industrial Instrument Co., Foxboro, Mass., describes the Hutchison marine tachometer, an instrument designed to indicate to the master or watch officer of a ship the direction and speed of rotation of marine engines in order to avoid misunderstanding of signals.

AIR COMPRESSORS.—The Union Steam Pump Co., Battle Creek, Mich., is distributing catalog B, 72 6 x 9-inch pages, in which is described the line of air compressors built by it, in belt, steam and motor driven types, together with accessories required for compressed air installations.

MINE LOCOMOTIVES.—The Jeffrey bulletin No. 17, 68 8 x 10-inch pages, describes a large line of electric locomotives for mine and industrial uses, built by the Jeffrey Mfg. Co., Columbus, O., with numerous illustrations of applications.

PIPE BENDING MACHINES.—J. Fillmore Cox & Co., Bayonne, N. J., in a 24-page 6 x 9-inch catalog describes a line of newly designed machines for producing various forms in bent and coiled pipe, with illustrations of various shapes which the machines are capable of producing.

## MUCH NEW CONSTRUCTION ON PACIFIC COAST IN 1909.

Although prices of machinery and iron trade products on the Pacific coast during 1909 were not wholly satisfactory from a producer's standpoint, the market exhibited nevertheless a constantly increasing capacity for the absorption of products, in the light of which the large increase in the amount of new construction in the west during the past year is not surprising. It is declared from authoritative sources that the amount of new construction on the Pacific coast last year in metal trades lines exceeded that of any previous year. At least one large plant, including in each case an extensive foundry, machine shop, pattern shop and boiler or plate shop, was built in each of the cities of Portland, Tacoma, Seattle and Everett. At Portland the new plant of the Smith & Watson Iron Works, designed for the manufacture of logging engines, is now receiving its final touches; at Tacoma the new logging engine and lumber machinery plant of the Puget Sound Iron & Steel Works was erected; in Seattle, the new plant of the Vulcan Iron Works, also manufacturers of saw mill and lumbering machinery, was finished and extensive additions were made to the shops of the Washington Iron Works; at Everett, the Sumner Iron Works is rebuilding its plant devoted to the manufacture of complete saw and shingle mills. The Sumner Iron Works is also erecting an auxiliary plant at Vancouver, B. C. The Willamette Iron & Steel Works, Portland, Ore., is building two ship building sheds, and during the past year made several additions to its ship building equipment, including a floating drydock operated by the Oregon Dry Dock Co.

### Many Plants Manufacture Lumbering Machinery.

It will be noted that, with one exception, all the important new construction on the north Pacific coast during the past year was in plants designed for the manufacture of lumbering machinery of some sort. This field is considered the most fruitful source of profit for the investment of money in mechanical industries in the west. Pacific coast-built saw mills and logging engines are the only products of western machinery manufacturers that are sold to any extent east of the Rocky mountains. The greatest market for lumbering machinery in the world is found in the Pacific northwest. On account of the large local demand, the north Pacific coast is rapidly becoming a center for the manufacture of saw mill and logging machinery, displacing Wisconsin, which was the undoubted center during the palmy days of the northern white pine industry. At present, machinery from the Pacific coast is being sold to lumbermen in Minnesota, Wisconsin, Manitoba and the timbered regions of the South.

It is estimated that, by the new construction during 1909 noted above, the capacity of north Pacific coast lumber machinery plants has been increased 30 per cent.

More new plants to take care of the lumber machinery business will be built during 1910. Among the most important works now projected are a new plant for the Vulcan Iron Works at Aberdeen, Wash., and a new steel castings foundry to be built in Seattle. It is also reported that the malleable iron foundry of the Acme Malleable Iron & Foundry Co. at Puyallup, Wash., which has been closed for nearly two years, will be reopened this spring.

## BRIQUETTING IRON TURNINGS.

A recent number of *Stahl und Eisen* reports the results of experiments carried on for some time at the Borsig works, in Silesia, in connection with the briquetting of iron turnings. This authority states that the experiments have been entirely successful, the briquettes produced showing such a uniform nature as to be superior in this regard to scrap, or even a good grade of pig iron. When made of gray cast iron they have been found to yield white iron when re-melted in closed crucibles or cupola furnaces and to show a loss of only from 8 to 10 per cent, as compared with about 50 per cent when turnings are re-melted, and an even smaller loss when about 20 per cent of pig iron is added before re-melting. The resulting metal is of excellent grain and high tensile strength, being found suitable for locomotive cylinders. The convenience in handling and storing these briquettes is commented upon, it being possible to store them out of doors without waste. The statement is also made that large producers of turnings will find it advantageous to operate their own briquetting plant, the process being applicable to other metal turnings as well.

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The Utah Copper Co. has filed at Trenton, N. J., an amended certificate increasing its capital stock from $7,500,000 to $25,000,000.

## PITY POOR AMERICA.

(*The Ironmonger*, London.)

As a matter of fact, the United States does not possess a big export trade, and cannot permanently beat us in foreign markets, simply because her manufacturers cannot afford that luxury. They cannot sell any great quantity of steel abroad at much of a profit, because they cannot produce it cheaply enough. Even the great Steel Trust has never made big profits. There are many iron and steel works in this country yielding much bigger profits per unit of capital invested and per unit of work performed than the United States Steel Corporation. In the United States the iron ore deposits are so far removed from the coal fields, and the manufacturing plants are so far from the seaboard, that it is impossible for that country at present to threaten seriously our supremacy in the world's markets. Besides laboring under great natural and geographical disadvantages, the American steel industry is burdened with an extravagant load of capital and labor charges. Here in Great Britain we have coal, iron ore, furnaces and natural harbors all practically side by side. America has no such advantages. Again we have the soundest system of finance in the world. It is a fallacy to imagine that America has a monopoly of the good things, or that Britain cannot hold its own in the iron and steel trade.

## GRADE CROSSINGS FEW IN PENNSYLVANIA.

The Pennsylvania railroad has made public some interesting figures regarding the elimination of grade crossings during the past ten years. On the lines of the system east of Pittsburg and Erie 673 grade crossings have been removed since Jan. 1, 1900, exclusive of the ten crossings which will be eliminated by work already arranged for at Bristol, Pa. In addition, 129 private crossings at grade have been removed. These figures take no account of grade revisions at congested points, whereby tracks for trains going in different directions have been either elevated or depressed, thereby removing the necessity for trains to cross tracks at grades.

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The annual meeting of the stockholders of the United States Steel Corporation has been called for April 18, in Jersey City.

# NEWS FROM MANY INDUSTRIES

(In order to assist the post offices in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

**New Buyers:—**

Articles of incorporation have been filed by the following manufacturing companies:

The Andrews-Carter Iron Works, Spartanburg, S. C., $10,000; by Isaac Andrews and Asa Carter.

The Obenberger Drop Forge Co., Milwaukee; $30,000; by John Obenberger, H. W. Ladish and H. C. Fuleuer.

The Sabin-Curtis Machine Co., Cleveland; H. B. Sabin, Arthur Curtis and J. H. Bomberger; $25,000.

The Haysler Iron Co., Kansas City, Mo.; capital $75,000; by E. C. Haysler Jr., Emma Haysler and others.

The American Tool Bending Co., New Haven, Conn.; $25,000; by H. S. Munson, J. H. Bradnack and G. C. Munson, all of New Haven.

The Titan Steel Casting Co., Newark, N. J.; $1,000,000; by Corwin Howell and Waldron M. Ward, of Newark, and John H. Conover, of Orange, N. J.

The Kurz Machine Co., Quincy, Ill.; machines, machinery and implements; $11,000; by William Kurz, Lawrence J. Weisenborn and Frank J. Koteera, all of Quincy.

The Jefferson Coal, Iron & Steel Co., to build and operate furnaces, rolling mills, etc., Birmingham, Ala.; $125,000; by Alan L. Jemison, H. T. Hazlett and J. W. Brazeal.

The Dean Mfg. Co., Cincinnati; foundry and machine shop; by Morris B. Dean, Archer G. Dean, George M. Stearns, Gordon W. Stearns and D. Lorbach Jr.; $100,000 capital.

The Sampson Nut Locking Co., Manhattan; taps, bolts, nuts, etc.; $20,000; by James C. Austin, 156 Broadway; Mary E. Gordes, 304 West 113th street; Earle W. Webb, 68 William street, all of New York City.

Quackenbush & Son, Inc., Paterson, N. J.; heavy and shelf hardware, mill, factory, etc., supplies; $125,000; by Peter C. Quackenbush, Harry Z. Sturr, William D. Seabrook and Leary Koch, all of Paterson, N. J.

The St. Lawrence Car Works, Ltd., Quebec; $250,000; by J. C. Scott, A. E. Doucet, B. A. Scott, George Parent, G. E. Amvot, Don J. Perry and G. L. Scott, all of Quebec, and C. L. Hervay and W. H. Ford, of Montreal.

Ideal Irrigation Rotary Pump Co., Seattle, Wash; $100,000; pumps and pumping machinery; by James C. Langley and Courtenay Baylor. A factory will be built in Seattle in the future, but for the present the pumps will be manufactured in existing machine shops.

The Standard Steel Co. of New Jersey, West Hoboken, N. J.; high speed tool steel, special alloy die steel, chrome nickel steel; $15,000; by Adam Wolfson, 215 Shippen street; Myer Rosenthal, 543 Angelique street, both of Weehawken, N. J.; Alfred A. Brock, 240 South street, Jersey City, N. J.

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**New Construction:—**

The Sebastian Lathe Co., Covington, Ky., has plans for a brick ware room 45 x 85 feet, to be added to its plant in the spring.

The Niagara Machinery & Tool Co., Buffalo, is considering plans for a one-story machine shop, 200 x 200 feet, to be built in the spring.

John Mohr & Sons, Chicago, are beginning the construction of two 400-ton metal mixers for the Indiana Steel Co., to be installed in the Gary plant.

The Talladega Foundry & Machine Co., Talladega, Ala., whose plant was seriously damaged by fire Jan. 21, advises that it will rebuild at once and will be in the market for new equipment about Feb. 5.

The Bellefontaine Bridge & Steel Co. has begun erecting the hot mill addition to the Niles, O., plant of the Empire Iron & Steel Co. The building will be a 140 foot extension to the eastern end of the main structure.

The new plant of the Goetz & Flodding Mfg. Co., brass founder, Chicago, is nearing completion at Clybourn avenue and Willow street, the site including ground space 296 x 300 feet, with an additional adjoining plot 100 x 210 feet.

The Brown-Lipe Gear Co., Syracuse, N. Y., will double its capacity to meet the increased demand for automobile gears. A new building, either of steel or reinforced concrete, will be erected at once and the working force increased to 1,700 men.

The Corbin Screw Corporation, New Britain, Conn., has let the contract to the New Britain Machine Co., for making a large part of the machinery equipment for its new factory building. The new building will be one third as large as the main building itself.

The Republic Iron & Steel Co. advises respecting the recent fire at its Mahoning Valley works, at Youngstown, O., that the equipment for a temporary machine shop has been purchased, and that plans are in course of preparation for proposed new shops.

The American Pulley Co., Philadelphia, advises that while it lately bought about five acres to meet foundry requirements, it does not at present plan building upon the land which it acquired. However, it is finishing an addition, 50 x 120 feet, on land previously owned.

The Lorenson Mfg. Co., Rock Island, Ill., which was recently incorporated to manufacture mowing machines, will let contracts shortly for a foundry 40 x 60 feet. The officers of the new company are: President, Carl Lorenson, of Nebraska; vice president, J. Juhl; secretary, John Lorenson, and treasurer, A. F. Nelson, all of Davenport.

The United States Cast Iron Pipe & Foundry Co. advises respecting a fire at its Columbus, O., plant that the fire did not destroy any of its buildings further than damaging the skylights and part of the roof. It expects simply to make repairs, taking out the burned part and renewing the buildings, which will remain the same as heretofore.

The American Car & Foundry Co. will begin Feb. 1 the construction of a brick and steel building 120 x 1,800 feet as an extension to its shops at St. Charles, Mo. A power house has just been built on the site, and hereafter the machinery equipment will be electrically driven. The proposed addition will be devoted to the manufacture of steel freight cars.

The Richmond Forgings Corporation, Richmond, Va., has purchased a site near Acca Station and will erect a plant to replace a structure at Belle Isle. It has awarded the contract for the erection of a building 60 x 160 feet, of steel construction, estimated to cost $10,000, and will install new machinery for manufacturing drop forgings.

The Vulcan Iron Works, New Britain, Conn., advises respecting some recently noted new construction that it is now building a foundry 110 x 203 feet, which is nearing completion. The entire machinery equipment has been purchased for its foundry. It expects to install a large air furnace which will increase its output nearly one half.

The Canada Iron Corporation, Ltd.,

Montreal, whose foundry was destroyed by fire Dec. 23, advises that no decision has been reached respecting rebuilding the plant as yet, as it may possibly remove and consolidate it with its plant at Three Rivers, P. Q. The corporation further advises that it has secured practically everything it may require in the line of plans, machinery equipment, etc.

The Steel Roof Truss Co., which was recently incorporated in St. Louis, expects within two months to occupy a plant of steel construction on a site of five acres in St. Louis county, near Valley Park. The main building will be 175 feet long and is estimated to cost $25,000. The company's offices are in the new Bank of Commerce Building, St. Louis. The officers are: President, J. H. Koehler; vice president, Francis H. Krenning; secretary and general manager, H. H. Ferguson

The Bay City Boiler Co., of Bay City, Mich., advises respecting the fire which, on Jan. 4, originated from an unknown cause, that the damage was sustained mostly by the building and the small tools. Temporary repairs are being made to the building, machinery equipment and transmission gear pending arrangements for a new and modern building which will be undertaken as soon as the weather will permit. The temporary arrangements will allow completing orders now on hand and taking care of spring trade.

The Globe Metal Co., smelter and refiner, Chicago, announces that about May 1 it will occupy its new smelting plant at Clybourn avenue and Clybourn place. The new plant covers 125 x 140 feet, is of steel and fireproof construction, and has a track the full length of the property. The company's capacity will be greatly increased, giving it the opportunity of filling all orders promptly. The equipment is new and modern, including crushing and concentrating apparatus for refining brass, ashes and residues.

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**General Industrial:—**

The Auto Stove Works, Aurora, Ill., has increased its capital stock from $30,000 to $50,000.

The Atlas Forge Co., Chicago, has increased its capital stock from $500,000 to $1,000,000.

The United States Radiator & Boiler Co., West Newton, Pa., is planning additions to its plant in the spring.

The Southern Skein & Foundry Co., Chattanooga, Tenn., has decreased its capital stock from $100,000 to $25,000.

The Maynard Steel Foundry Co., Milwaukee, has amended its articles of incorporation, increasing its capital stock to $10,000.

The Valley Foundry & Machine Works, of Fresno, Cal., has filed a certificate decreasing the number of its directors from five to three.

The Braun & Stewart Co., of Philadelphia, has been awarded the contract for building three 70-ton traveling cranes for the Baldwin Locomotive Works at Eddystone, Pa.

The Scott-Madden Iron Works Co., St. Louis, which recently increased its capital stock, advises that at the present time it does not intend to make extensive changes at its present plant.

The Buckeye Iron & Brass Works, Dayton, O., has elected these officers: President, Charles Pease; vice president, E. G. Pease; secretary, William P. Anderson; assistant secretary, Arthur Johnson; general superintendent, George Sauer Jr.

T. P. Conant was elected president of the Sligo Iron Store Co., St. Louis, at the recent stockholders' meeting; C. B. Blake, vice president, and G. K. Conant, secretary and treasurer. The above named officers constitute the board of directors.

The Northwest Steel Co., of Portland, has secured the contract to supply the steel to be used in the construction of the 8-story building being erected in Spokane by the Spokane Realty Co. The contract calls for the delivery of the steel within 60 days.

The Valley Foundry Co., Canal Dover, O., advises that it was organized to make aluminum and probably brass castings, and expects to begin operating after Feb. 1. It has just received orders for 15 tons of small castings from O. C. Barber, of Akron.

The Rhineland Machine Works Co., 50 Church street, New York City, advises respecting its recently noted incorporation, that it is devoting itself exclusively to representing its factory at Dusseldorf, Germany, in the importation of ball bearings, forgings, etc.

The Keelyn Electric Co., of Milwaukee, advises as to plans following its recent fire that negotiations are pending for a lease of ground upon which it is proposed to erect a building that will house the plant of the electric company as well as the plant of Downey & Kruse Co., heating contractors, also involved in the fire.

Announcement is made of the change of name of The Empire Machine Co., of Hamilton, O., to The Triumph Laundry Machinery Co., in order that the name may be identified with the Triumph line of machinery. The management remains as heretofore, the officers being: President, A. Davidson; vice president, P. L. Brockhardt; secretary, A. J. Davidson.

At the annual meeting of the directors of the Niles Tool Works, Hamilton, O., held Jan. 25, the following officers were elected: President, James K. Cullen; vice president, George T. Reiss; secretary, Joseph L. Blair; assistant secretary, Miles T. Watts, of Cincinnati; treasurer, C. L. Cornell, of New York; assistant treasurer, Lucius B. Potter.

The Freeport Gas Machine Co., Inc., Freeport, Ill., advises respecting its recently noted increase of capital stock that this is for the purpose of taking care of its steadily increasing business, which has reached such proportions that its former capital stock was not sufficient to handle it. No additions to its plant are contemplated at this time.

The stockholders of the New Orleans Metal Bed Co. Ltd., New Orleans, La., at a recent meeting, reorganized by the election of these officers: President, Richard D. Hanna; vice president and manager, George H. Thomson; secretary, J. C. Hollingsworth, and treasurer, John H. Hanna, who together with John W. Eroe, compose the board of directors. J. N. Scherrouse has disposed of his interest in the company and retired from the presidency.

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**Trade Notes:—**

The Standard Bridge Co., Red Oak, Ia., announces that on account of controlling other auxiliary plants it has found it necessary to change its name to its original name of the Red Oak Bridge & Iron Works, and in the future it will be known under that title. The company is still owned and controlled by the Standard Bridge Co., Omaha, Neb., and there will be no change in management.

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**Fires:—**

The machine and boiler shop of the Shenango Furnace Co., Sharpsville, Pa., was damaged Jan. 25, the loss amounting to about $500.

The shops of the Victor Tool Co., Waynesboro, Md., were badly damaged Jan. 16, the loss being placed at $15,000, with $10,000 insurance.

The foundry department of the Mann Edge Tool Co., Lewiston, Pa., was seriously damaged Jan. 23, the loss being estimated at $75,000.

The pipe and fitting plant of the Lee Foundry Co., Anniston, Ala., was seriously damaged by fire Jan. 25, the loss being estimated at about $5,000. A part of the company's patterns were burned.